

# Western Industry

August  
1956

Vol. XXI, No. 8



**ELIMINATING STRAIN INJURY** on the production line, special carts are just one pay-off idea in blue-collar safety program at AirResearch, Fremont. Story on p. 37

**TODAY'S  
50 BEST  
MANUALS ON  
WELDING  
METHODS AND  
PRODUCTS  
yours for  
the asking  
... p. 65**

**TANK BEARING JOB** costs \$250,000, with new welding, tank  
the steel shell over the past 40-45 years. Story on p. 48

Now... complete stocks, prompt deliveries  
of Aluminum rod, bar and wire

from any of the 8 Western warehouses  
of

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warehouse  
stocks

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assistance

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attention

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On orders of any size...every time you need aluminum, phone your nearest Clingan & Fortier warehouse FIRST. You'll get the *exact* aluminum rod, bar or wire you need...*when you need it!* We believe our specialized aluminum service will please you and pave the way for *more* calls.

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## Ship United

**RESERVED AIR FREIGHT** guarantees you space dependability on all Cargoliners—and Mainliners!

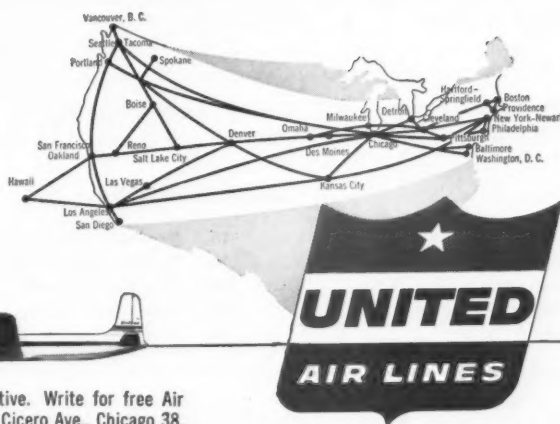
**AIR FREIGHT SHIPMENT** with passenger-plane speed and dependability—that's United's offer to you!



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\*These are the rates for many commodities. They are often lower for larger shipments. Rates shown are for information only, are subject to change, and do not include the 3% federal tax on domestic shipments.



For service or information, call the nearest United Air Lines Representative. Write for free Air Freight booklet, Cargo Sales Division, Dept. WI-8, United Air Lines, 5959 S. Cicero Ave., Chicago 38.

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August 1956

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## EDITOR

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## ASSISTANT EDITOR

L. V. Wilson

## NEWS EDITOR

Beverly T. Watkins

## CONSULTING EDITORS

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Market and Industrial Development

Roy C. Henning  
Electricity and Electronics

## SOUTHERN CALIFORNIA EDITORIAL CORRESPONDENT

Sterling Gleason  
Los Angeles, Calif.  
Phone Pleasant 1-2580

## PRODUCTION MANAGER

Patricia N. Mann

## CIRCULATION MANAGER

Kyle Cunningham

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James I. Ballard . . . President  
V. C. Dowdle . . . Vice Pres., Adv. Sales  
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WESTERN MANAGER—Roderick V. Pianta  
1012 So. Westmoreland Ave.  
Apt. 203  
Los Angeles 6, Calif.  
Phone: DUnkirk: 8-5740



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# Quaker



## Maintenance costs slashed by this specially engineered belt



*For speed and savings buy from your industrial supply distributor. He can help you select the right belt for your jobs—and, if necessary, bring you the free consultation service of Quaker-Quaker Pioneer field engineers.*

Are your hot-materials handling jobs taking an unnecessarily heavy toll in belt costs? They needn't—if you use conveyor belts specially engineered for your specific job conditions. Here's a case that gives real weight to that argument. For 11 months this belt hauled 850,000 tons without requiring replacement—more than double the life of belts previously used on this job. It is one of several types engineered by Quaker-Quaker Pioneer for jobs involving temperatures over 400°F. Some, like this one, are rough top construction enabling the belt to react rapidly to cooling methods. Others are of newly developed compounds, exceptionally heat-resistant to prevent hardening and cracking. Get the cost-saving benefit of this specialization by telling us—or your distributor—*your* problems. Our complete line contains everything you need in industrial rubber products, including hose, packing and moulded rubber for every use.

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H. K. PORTER COMPANY, INC.

**QUAKER PIONEER RUBBER DIVISION  
H. K. PORTER COMPANY, INC.**

**Pittsburg, California**

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WESTERN INDUSTRY — August 1956

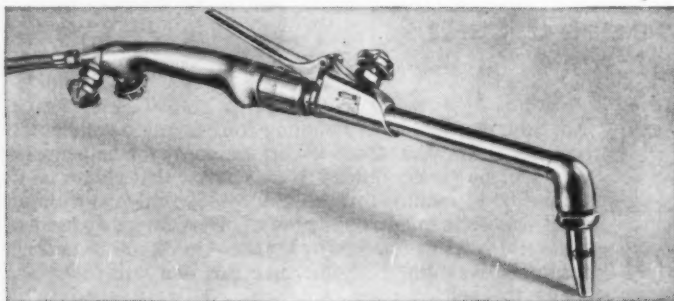
**ONE wide-range**  
**"OXWELD" W-45 BLOWPIPE**  
Trade-Mark  
**handles EVERY welding**  
**and heating job**

**NO OTHER SINGLE BLOWPIPE OFFERS  
 THIS EXTENSIVE RANGE!**

Anyone whose daily work includes welding and heating will readily appreciate the amazing wide range and versatility of the new OXWELD W-45 Blowpipe. Its 18 head sizes (2 to 300 cu. ft. per hr. capacity) provide a perfect flame for every metal thickness. Light sheet to heavy plate, *one blowpipe does it all!*

From chrome-plated tip to offset hose connections, the W-45 shows the results of over a decade of development work by LINDE engineers. Its exclusive "jiffy-lock" heads, "form-fit" handle, and advanced styling are as modern as guided missiles and atomic power. "O" ring gas seals, flame-stabilizing mixers of improved type, and many other innovations put this blowpipe far ahead of the field in economy, ease of operation, and low-cost maintenance.

See for yourself how you can enjoy tomorrow's operating standards today with an OXWELD W-45 Blowpipe. Ask your LINDE representative for a demonstration, or write for free booklet, F-8684.



*W-45 Cutting Attachment adapts the W-45 Blowpipe for cutting steel up to 8 inches thick.*

**Linde Air Products Company**

**A Division of Union Carbide and Carbon Corporation**

30 East 42nd Street **UCC** New York 17, N. Y.

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 Division of Union Carbide Canada Limited, Toronto  
 (formerly Dominion Oxygen Company)

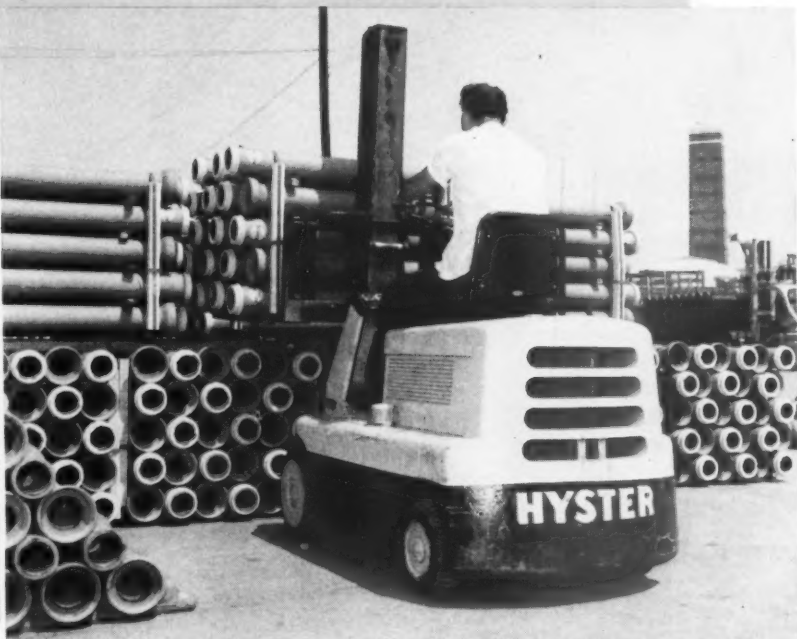
*The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.*



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**WESTERN INDUSTRY — August 1956**



# HYSTER MAKES THE RIGHT INDUSTRIAL TRUCK FOR YOUR JOB



Pictured above is one of many typical examples of how Hyster® Industrial Trucks are helping to effect tremendous savings in the cost of materials handling in Brick and Clay Plants.

Even if you are now using lift trucks or have never used industrial trucks of any kind, your Hyster dealer can show you how you can quickly realize more profit from your operation with these multi-purpose utility tools. Your Hyster dealer knows materials handling... he is an expert on the problems and their solution. He can help you with special techniques and cost reducing methods. Call him today... why not take advantage of his materials handling know-how? He is listed under "Trucks-Industrial" in your telephone directory.

"Monomast" Spacesaver® 40 lift truck stacking speed-seal® 4" house-connection clay pipe. Each no-deposit, throwaway pallet contains pipe for 4 average jobs—30 pipe 4 ft. long, 30 gaskets.

## HYSTER DEALERS GIVE YOU ALL 3!

- 1 PLANNING**—your Hyster Dealer will plan your materials handling operation from scratch, or will analyze your present system to see if it can be improved.
- 2 THE RIGHT TRUCK**—for your job from Hyster's complete line of industrial trucks (1,000-30,000 lbs.) and over 100 job-attachments for economical load handling.
- 3 THE RIGHT SERVICE**—ample spare parts stock, shop facilities, factory-trained mechanics and an efficient field service that keep your Hyster lift trucks going on your job, wherever your job might be located. Hyster trucks are noted the world over for their low downtime.

**Materials Handling Trucks from  
1,000 to 30,000 pound capacities**



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Delivery and shipping facilities at Los Angeles branch. Above: Pipe warehouse

## Crane meets all your piping needs with complete local service

Regardless of your location, you can realize the full benefits of Crane quality and service right in your own area. 19 strategically located Crane Branches plus Crane Wholesalers everywhere are at your service.

Everything you need in valves and fittings is available through your local Crane outlet. If it's a staple item, chances are it will be in stock—even in large quantities.

You'll like the quick, convenient over-

the-counter service. You'll also like the prompt, efficient way your telephone "will-call" orders are handled.

Any items not stocked locally will be on their way in double-time from the great Crane factory warehouses in Chicago. So either way, you're ahead with Crane. And with the world's broadest line to choose from, you're sure of getting all your needs.

Contact your local Crane Branch or Wholesaler for complete information.

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# CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

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**NEW**

**AMERICAN offers SYNTHETIC FELTS**

## Thermal Resistance...Chemical Resistance!

### Now Available!

- **DACRON\***
- **ORLON†**
- **NYLON**
- **ARNEL®**
- **ACRILAN\*\***
- **DYNEL††**

### Send today for fact sheets!

\*DuPont trademark for its polyester fiber

†DuPont trademark for its acrylic fiber

\*\*Acrylic fiber by Chemstrand

††Union Carbide's acrylic fiber

Now, American, through its technical research, has perfected the mechanical interlocking of the man-made fibers listed at the left, to produce three-dimensional felt structures.

These new Felts by American have exceptional *chemical resistance* with *thermal stability* to 300 F. They are non-hygroscopic, biologically stable and are available in a complete range of thicknesses. Precision engineering assures close

density and thickness control.

The properties which characterize these new Felts are being utilized in filtration—laminated plastics as reinforcing material—high temperature bearing seals—gasketing. In fact, end uses are unlimited!

American's engineering and research staff is prepared to supply you with complete data and product recommendations. Write today!

**American Felt  
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TRADE MARK  
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GLENVILLE ROAD GLENVILLE, CONN.

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PLANTS: Glenville, Conn.; Franklin, Mass.; Newburgh, N. Y.; Detroit, Mich.; Westerly, R. I.  
ENGINEERING AND RESEARCH LABORATORIES: Glenville, Conn.

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## *Traveloader*... revolutionizes long load handling!

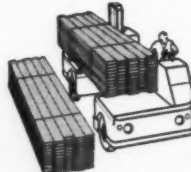
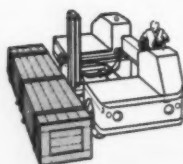
Here at last is a practical answer to the awkward problems of yard handling and particularly those nightmarish long loads. Traveloader combines the unique ability to pick up, carry and stack long, unwieldy or multiple pallet loads—indoors or out. Operating over paved or unpaved roadways, it does the job fast, safely, and much cheaper than other equipment.

This one machine, with one operator, replaces two and often three fork trucks, portable cranes or straddle carriers, and does the job better. You save manpower, cost of buying and maintaining other expensive equipment, aisle space, and time. Because Traveloader loads from the side and carries loads lengthwise, it requires much less aisle space than fork trucks.

Unlike a straddle carrier, this new machine can stack up to 12 feet high. And when traveling, the load is nested safely aboard the Traveloader's deck, eliminating dangerous dangling and swaying of load, distributing load over six large wheels, and making speeds up to 30 MPH practical and safe.

Write for descriptive bulletin No. 1360.

**ONLY  
TRAVELOADER**



Picks up like a straddle truck • Delivers like a highway truck • Stacks like a fork truck

**Baker**

handling equipment

**THE BAKER-RAULANG COMPANY**

1290 WEST 80th STREET • CLEVELAND 2, OHIO

A subsidiary of Otis Elevator Company

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WESTERN INDUSTRY — August 1956



Sergeant Sticky Says...

## "Talking Tape Gets Attention!"



Wherever your carton goes, "Talking Tape" speaks right up, sells as it seals—broadcasts your message in your words. It instructs. Warns. Identifies. Provides a person-to-person advertising campaign too profitable to pass up!

And best of all, Flash-Tite "Talking Tape" messages—either stock or custom printed—cost less than applying printed labels.



Another quality product by



**CROWN ZELLERBACH**  
SAN FRANCISCO 19, CALIFORNIA

© CZ-202

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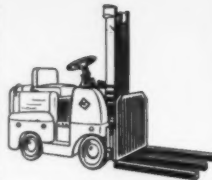
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Crane Arm



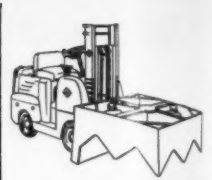
Hydraulic or  
Mechanical Scoop



Side Shifter



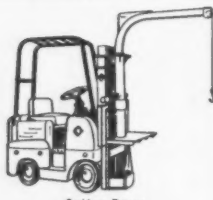
Revolving Carriage



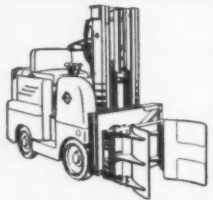
Multiple Drum Carriage



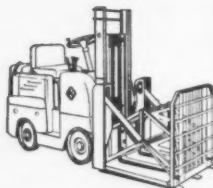
Dual Telescopic Mast



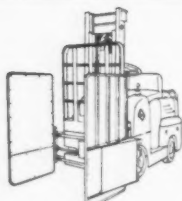
Cotton Boom



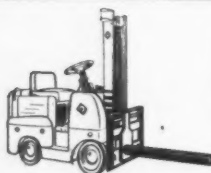
360° Rotating Carriage  
and Clamp



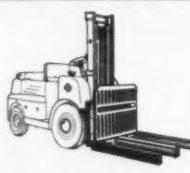
Unloader



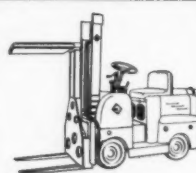
Carton Clamp



Ram



Brick and Block Forks



Load Stabilizer



Extension Package Rack



Clamps



## ALLIS-CHALMERS Fork Trucks

demonstrate

## OUT-IN-FRONT VERSATILITY

with a complete line of interchangeable attachments!

Allis-Chalmers Fork Trucks handle all forms of materials with the dexterity of skillful hands. Depending on the type of material or its container, an Allis-Chalmers Fork Truck can be equipped to scoop it, pour it, boost it, hook it, grip it, turn it upside-down . . . even skewer it.

In addition to the standard attachments shown here, there are many more. Allis-Chalmers will be happy to work with you on attachments to meet your own particular material handling needs.

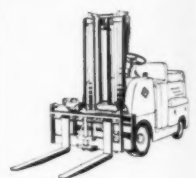
Ask your Allis-Chalmers Material Handling dealer to show you how this out-in-front versatility can speed many jobs throughout your plant, or write for more information.

MATERIAL HANDLING DEPT., BUDA DIVISION, MILWAUKEE 1, WISCONSIN

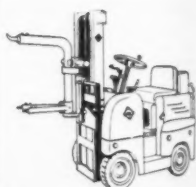
# ALLIS-CHALMERS

Western Factory Branches: Portland, Oakland, Los Angeles

BH-24



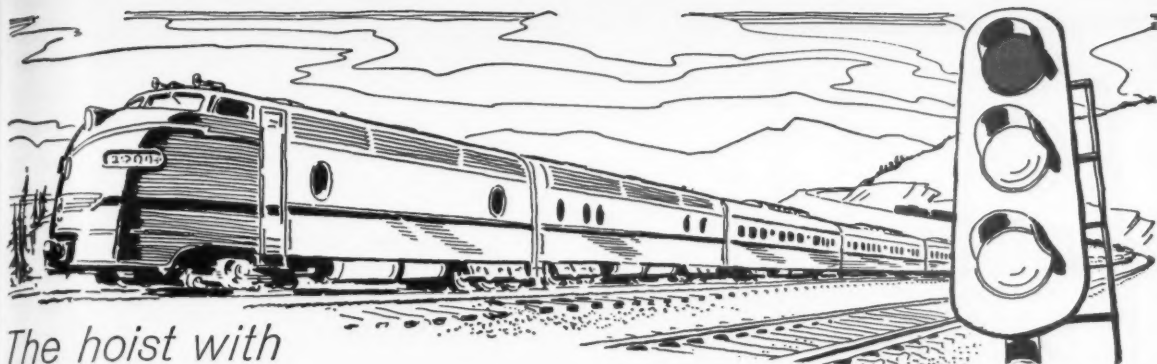
Swing Shift



Garrett Breakout

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WESTERN INDUSTRY — August 1956



The hoist with

# EXPRESS TRAIN BRAKES

It's *Lodestar*® of course!



● **CALL YOUR CM  
DISTRIBUTOR  
TODAY**

for catalog, prices or  
immediate delivery  
of the safer  
Lodestar.

**CAPACITIES**

from 1/8 to 1 ton.  
Single and 3 phase.

**Priced at  
\$149.50**

**AND UP  
F.O.B. Factory**

**NOW...FOR POSITIVE SAFETY...** *this new small  
electric hoist has ultra-modern dual braking...just like  
today's streamliner.*

1. Like a train on a steep grade—**AUTOMATIC REGENERATIVE ELECTRIC BRAKING** safely sustains the descending load.
2. For stopping—the **MECHANICAL FRICTION BRAKE** safely locks the load. Any power interruption—intentional or accidental—automatically sets the mechanical brake to hold the load securely.

No other small electric hoist offers this dual electro-mechanical system—**THE SAFEST BRAKING AVAILABLE.**★

★ Lodestar really meets the requirements of the National and all State Safety Codes.



**CHISHOLM-MOORE HOIST DIVISION**

Columbus McKinnon Chain Corporation  
Tonawanda, New York

DISTRICT OFFICES: NEW YORK • CHICAGO • CLEVELAND  
In Canada: McKinnon Columbus Chain Ltd., St. Catharines, Ont.

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**HOW DO YOU PICK YOUR BRAND** when you buy an electric motor? Or any other piece of heavy industrial equipment? "Purely technical advantages—performance, price, and so on," is probably your answer.

Motivational research just concluded by General Electric should make you stop and wonder a bit. GE's survey has proved that *purchasers of industrial equipment are just as subject to personal prejudices and emotional sales appeals as buyers of shirts, cigarettes, and automobiles.*

For example, many industrial men think of d-c. apparatus as a bit "old-fashioned" because of the major contributions direct current made in the early days of industrial electrification. This easily leads to a "psychological motivation" that tends to prevent objective consideration of the essential modern-day roles d-c. motors and generators are playing in automation processes.

Next time you're talking with an industrial salesman, see if you can spot any emotionally-inspired motivations in your reaction to his product.

**TWO "MYSTERY" PRODUCTS MADE BY SMALL WESTERN FIRMS**, both of keen interest to economy-minded plant operating men, have emerged unscathed from long adjudication before the Federal Trade Commission. One is "Battery AD-X2," an additive reported to double or triple useful life of lead-acid batteries, including large stationary batteries and lift truck batteries. (It's made by Pioneers, Inc., 2411 Grove St., Oakland, Calif.) The other is the "Evis Water Conditioner," a special oversized coupling intended to be fitted into water systems and beneficially affect water so that scale deposits and corrosion are largely eliminated in boilers, evaporators, etc. (made by Evis Manufacturing Co., 40 Boardman Place, San Francisco).

There have been numerous similarities between the two cases, and it may be more than coincidence

that the FTC handed down the two decisions within a three-day period after hearings in both cases had extended over two or more years.

A chief similarity, for example, has been that nobody seems to understand much about the principles that make the products work, but an overwhelming majority of users insist that definite and substantial benefits have resulted from their application. In one of the cases (Evis), the FTC examiner summed up this "air of mystery" when he stated: "Scientists admit that they do not understand the theory of its operation and will not preclude that it may operate as represented. In view of this, we must not take the risk of interfering with the development of a device which may prove to be the first practical application of a scientific principle heretofore undiscovered."

In both cases, too, there is a moral, as stated by Jess Ritchie, president of Pioneers, Inc.: "It is our hope that small businesses will draw strength and courage from our long struggle, to fight for their rights."

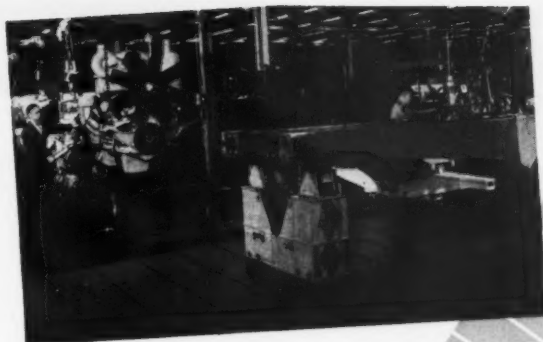
*You'll be hearing a lot more about AD-X2 and the Evis conditioner now that both firms have been freed from restraint on their sales activities.*

**YOU'RE LOOKING AT A PRIZEWINNER**, we're proud to say. In competition among all Western business publications, conducted annually by the Western Society of Business Publications, WESTERN INDUSTRY was awarded two blue-ribbon plaques for (1) best special issue and (2) best departmental column of any Western publication. And WI was the *only* magazine awarded two first place prizes in the seven major categories of the contest.

To top it off, WI placed third in the "grand prize" classification, for best all-around job in behalf of readers and field served. (Second place was taken by WESTERN CONSTRUCTION, companion publication to WI here at King Publications.)

**ANOTHER "FIRST" IN PUBLISHING** is coming your way, in the September WESTERN INDUSTRY. Not only will it be WI's first annual Power Issue (with a number of special articles tipping you off on better ways to utilize modern power equipment and systems in your plant), but the issue will also contain the *first industrial power equipment buyers' directory ever published for men in the Western manufacturing industries.* Manufacturers of all types of plant power products—electrical, hydraulic, mechanical power transmission, etc.—will be listed, along with complete where-to-buy-it data for Western plant operating executives.



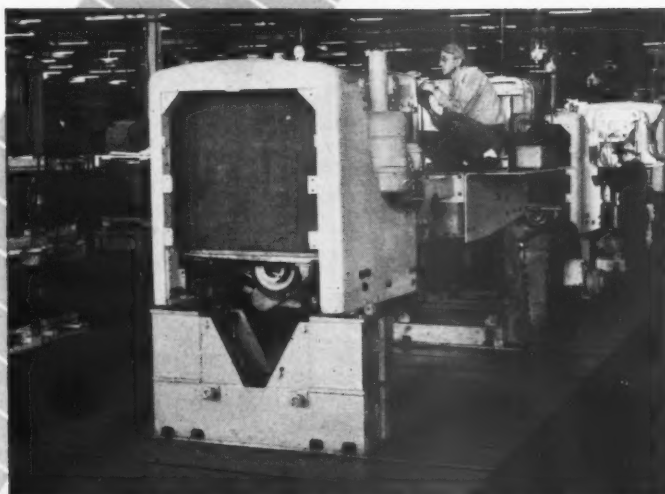


Engine feeder line . . . completely assembled engine being transferred to final assembly line.

## Conveyors Carry 40,000 pound Caterpillar-built Tractors



Track roller frame assembly line . . . unit in foreground is ready for assembling to tractor.



Tractor at end of assembly line . . . ready for roller frame assemblies and tracks.

To obtain maximum production of the world's largest track-type tractors, Caterpillar Tractor Co. has installed in its Peoria plant a system of Webb slat conveyors that serves as assembly lines. The main assembly line, which is a slat conveyor 9 feet wide and over 320 feet long, is one of the largest conveyors of this type in the world. Tractors assembled on this conveyor line average approximately 40,000 lbs. each.

Three other slat conveyors, also flush-floor-mounted, complete the tractor assembly system. One conveyor is used for feeding engines to the main line and the other two for assembling track roller frames. Each of the four conveyors is installed and fixtured to automatically carry the assemblies from one operation to another and keep work at the most convenient height.

Large and small industries throughout the world, for over 35 years, have been using Webb engineering skill, manufacturing experience and installation ability to solve every type of materials handling job. We will welcome an opportunity to discuss your needs or problems.

**WRITE FOR:**  
Catalog 50 . . . Trolley Conveyors  
Catalog 51 . . . Floor Conveyors  
Catalog 52 . . . Power & Free Conveyors

### JERVIS B. WEBB CO. of CALIFORNIA

*Specialists in Custom Conveyor Systems*

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. . . for more details, circle No. 11 on Reader Service Postcard

WESTERN INDUSTRY — August 1956

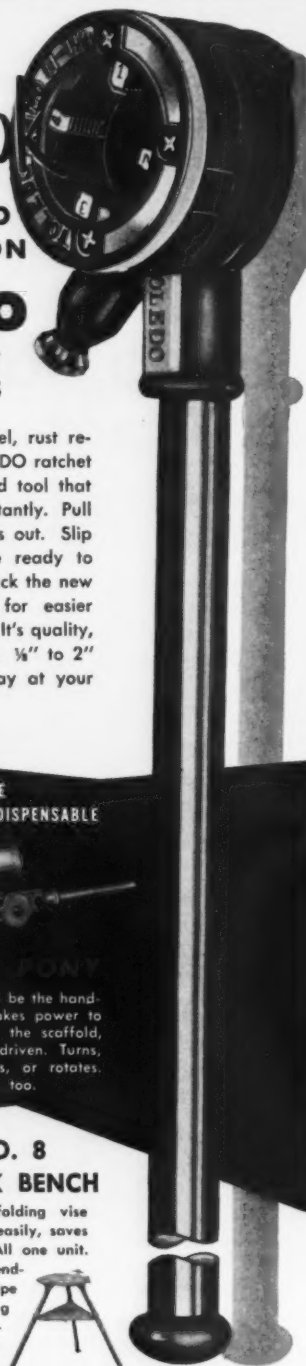
# New Look

**SAME SOLID  
SATISFACTION**

## TOLEDO

**SMALL RATCHET  
PIPE THREADERS**

You'll like the rifle barrel, rust resistant finish of the TOLEDO ratchet Threader—the drop head tool that lets you change dies instantly. Pull the pawl—the die drops out. Slip in another and you're ready to go. It's that easy. Check the new bright red ball end for easier handling, better grip. It's quality, like all TOLEDO tools.  $\frac{1}{4}$ " to 2" sizes. See them today at your suppliers.



THE  
INDISPENSABLE

The No. 68 Power Drive will be the handiest tool on your truck. Takes power to the job—up the ladder, on the scaffold, in the ditch. Electric or air driven. Turns, threads, cranks, lifts, pulls, or rotates. Makes an ideal bench tool, too.

### TOLEDO NO. 8 FOLDING WORK BENCH

A strong, sturdy folding vise stand that sets up easily, saves time and effort. All one unit. Has three pipe benders, tool slots, pipe rest and ceiling brace. A portable work bench that meets all needs. Wt. 33 lbs.



THE TOLEDO PIPE THREADING MACHINE COMPANY  
TOLEDO 4, OHIO

BUILDERS OF THE WORLD'S FINEST PIPE TOOLS®  
**TOLEDO**  
PIPE THREADERS • PIPE WRENCHES • PIPE MACHINES

... for more details, circle No. 12 on Reader Service Postcard

## LETTERS

### Electrolytic neutralizers good for boiler scale?

EDITOR—In the June 1956 WESTERN INDUSTRY we read an interesting article, "Today's Package Boilers," by Reese D. Hansen, Consulting Engineer, Long Beach, Calif. The information derived from this article is greatly appreciated.

Our company operates several steam boilers in Idaho and Montana, as well as in Oregon. At our two Oregon operations, we find it necessary to use an additive to the water to relieve scale accumulation. This scale presumably is caused by the mineral content of the feed water.

Recently, we have been approached by suppliers of electrolytic neutralizers, which we are told will perform the same function as proper additives to the feed water. Before giving these neutralizers a trial, we would like an opinion as to the correctness of these claims from a qualified engineer, possibly Mr. Hansen.

C. E. KEMMERER,  
Manager, L. D. McFarland Co.,  
Eugene, Ore.

(Reese Hansen's answer to Mr. Kemmerer's request for an opinion on electrolytic neutralizers, in the form of a letter direct to him, is reproduced below. WESTERN INDUSTRY intends to present a thorough discussion on electrolytic neutralizers and similar water treatment devices in an issue this fall, and we would appreciate hearing of experiences you have had with them in your plant. Please write us at 609 Mission St., San Francisco 5—Ed.)

MR. KEMMERER—WESTERN INDUSTRY has forwarded your letter regarding electrolytic neutralizers to me.

The neutralizer you have in mind appears to be a type of unit incorporating sacrificial members which the corrosive elements in water would attack instead of the boiler metal. With certain water conditions, such units may be satisfactory. Personally, I have never used units of this type, nor have I seen any reports in various technical magazines on the use of such units.

With the variation in the water in different localities and in the operating conditions of different plants, I feel there is no one treatment that will take care of all of the various possible conditions. As I stated in the June WESTERN INDUSTRY article, I feel that the best method is a treatment based on an analysis of the boiler feed water and periodic checks of the boiler water itself.

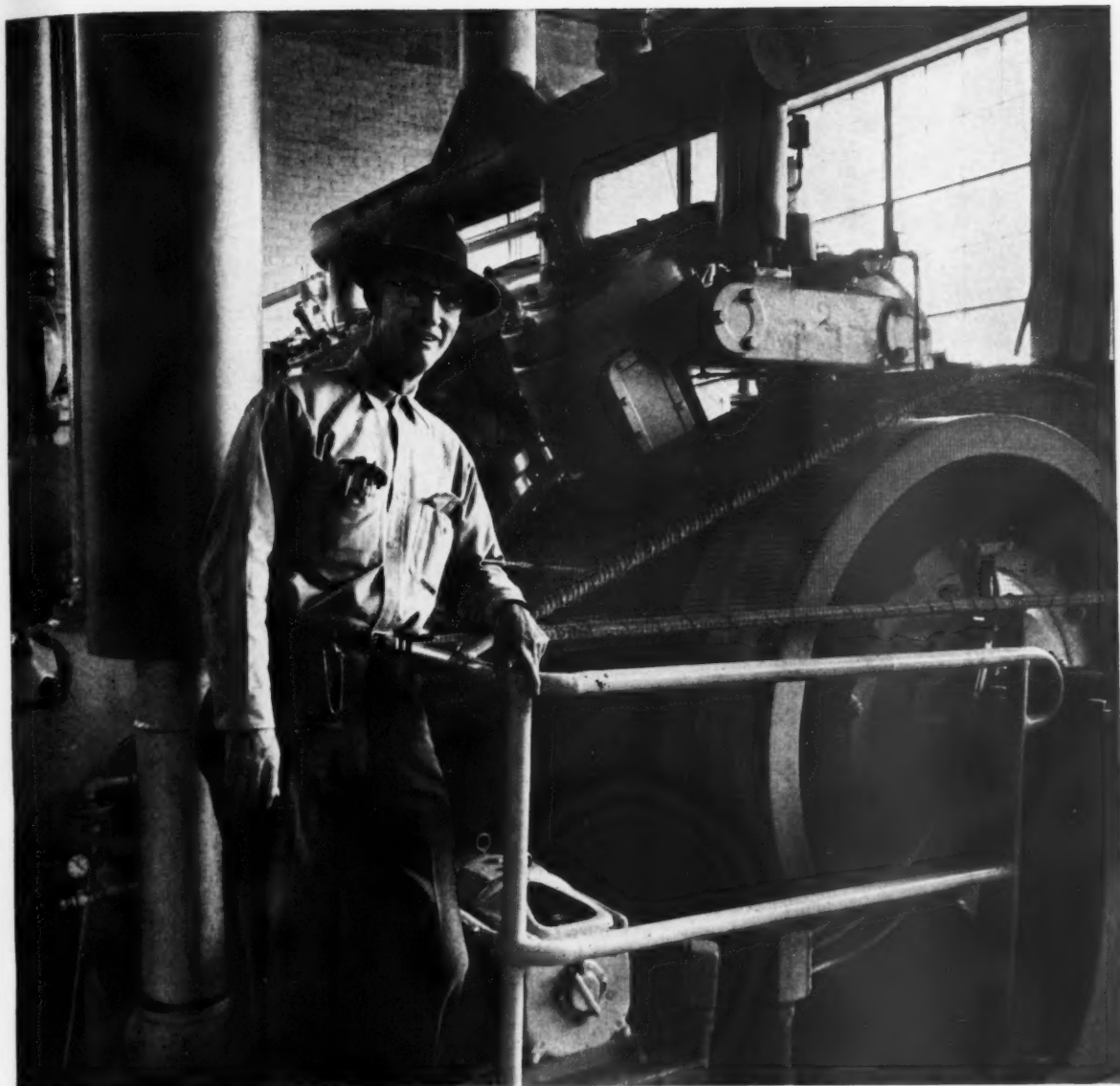
REESE D. HANSEN  
Consulting Mechanical Engineer  
Long Beach, Calif.

### Case of the missing card

EDITOR—I have just finished reading the May issue of WESTERN INDUSTRY and am interested in receiving some of the valve and fitting catalogs you have listed. However, I am on the route list for your publication with several other engineers, and by the time I had a chance to read it the reader service cards were both gone. Therefore, the following is a list of the six catalogs I would like to receive.

F. W. POUCHER  
Process Engineer, General  
Electric Co., Richland, Wash.

(Two reader service cards are supplied in each issue for the benefit of "pass-along" readers, but if they're both used before you receive your copy, a regular postcard or letter is also honored.—Ed)



Alvin G. Hubbard, chief engineer, Arizona Ice and Cold Storage Company, Tucson, Arizona

## "with Union's T5X Motor Oil...8,400 hours per year"



"Not long ago an Ingersoll-Rand service engineer came in to tell me that our 285 h.p. engine had the best service record of any in his field, and to ask what our secret was.

"I told him we have no secret. We keep the sump filled with Union's

T5X Motor Oil, and the engine just keeps running.

"This Ingersoll-Rand, which was new in 1939, has been in constant operation 8,400 hours (351 days) per year. It was last rebored in 1951. Since that time we've replaced no rings or other parts because of wear. In fact, when we last ground the valves there wasn't enough wear in the engine to warrant even a check. Oil consumption averages about 12 quarts in 24 hours, and using a standard Nugent filter we change oil only in the course of our annual overhaul.

"I depend completely on T5X to keep this engine driving our 100 KVA generator, our air and our two ammonia compressors. I'll recommend it to any stationary diesel engine operator anytime, anywhere."

Try T5X and you'll be as enthusiastic as Mr. Hubbard is about this amazing purple motor oil. Immediately available from your nearby Union Oil representative.

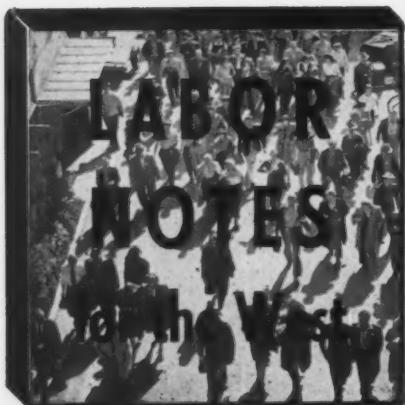
**UNION OIL COMPANY**  
OF CALIFORNIA



Los Angeles: Union Oil Bldg. • New York: 45 Rockefeller Plaza • Chicago: 1612 Bankers Bldg. • Philadelphia: Eastwick Ave. & Edgewood St.  
Dallas: 313 Fidelity Union Life Bldg. • Kansas City, Mo.: 612 W. 47th St.  
New Orleans: 644 National Bank of Commerce Bldg.

... for more details, circle No. 13 on Reader Service Postcard





**A POSTWAR RECORD FOR PEACEFUL RELATIONS** between labor and management in California was attained during the first six months of 1956, according to Ernest B. Webb, Director of the California Department of Industrial Relations. Less than 25,000 California workers were involved in work stoppages from January 1 through June 30, the smallest number for this period in more than 10 years. (It compares with 87,500 workers idled during the same period last year.)

Although July saw a marked upturn in strike activity with the outbreak of the steel industry strike, the total number of workers involved in stoppages so far this year in California, including July, is still the lowest of any recent year.

The department has just come out with its annual report of union organization and collective bargaining in California, **Union Labor in California, 1955**. The 68-page bound report lists union membership in ten economic areas of the state and in a number of different industries, discusses aspects of collective bargaining structure in some 38 industries, and supplies a calendar of collective bargaining showing the time of year when major contract negotiations in each industry are scheduled. You can obtain a single copy free from: Dept. of Industrial Relations, Div. of Labor Statistics and Research, State of California, P. O. Box 965, San Francisco 1.

**A CHECK-LIST CRITERIA OF EMPLOYMENT PRACTICES** for the guidance of professional engineers and their employers have been adopted by the board of directors of the National Society of Professional Engineers. The criteria were presented to the board as a recommendation of the society's Engineer-in-Industry Committee at the group's annual meeting in Atlantic City.

Printed in check-list format, the criteria cover specific categories of engineering career development, starting with the recruitment of the engineer and leading through the various phases of his experience. The questions on the check-list suggest the responsibilities of the employer to his professional employees, and the latter's responsibilities to the employer.

Topics included in the criteria are recruitment, indoctrination, technical, administrative, personality, and professional development of the individual, salaries, engineering titles, personnel practices, and termination policies.

If you want more information, contact NSPE headquarters at 2029 K St. N.W., Washington 6, D.C.

**A NEW PRE-SUPERVISORY TRAINING PROGRAM** has been tested, proved, and installed as a regular training feature at the Nevada Mines Div. of Kennecott Copper Corp., McGill, Nev. Purpose of the program is to make sure that men in the working force with supervisory ability and operating skills are not overlooked and to provide management with a broader selection of capable supervisors. Here's how it works:

Any employee can make application. Approved applicants are given supervisory and mechanical aptitude tests and trainees for the course are chosen on the basis of these test results.

Classes are scheduled on the employees' own time, and training is by members of the firm's Training Center staff. Schedule of training includes 54 hours of study in human relations, safety, principles of supervision and management, labor relations, and job simplification. There is no training in craft skills or operational aspects.

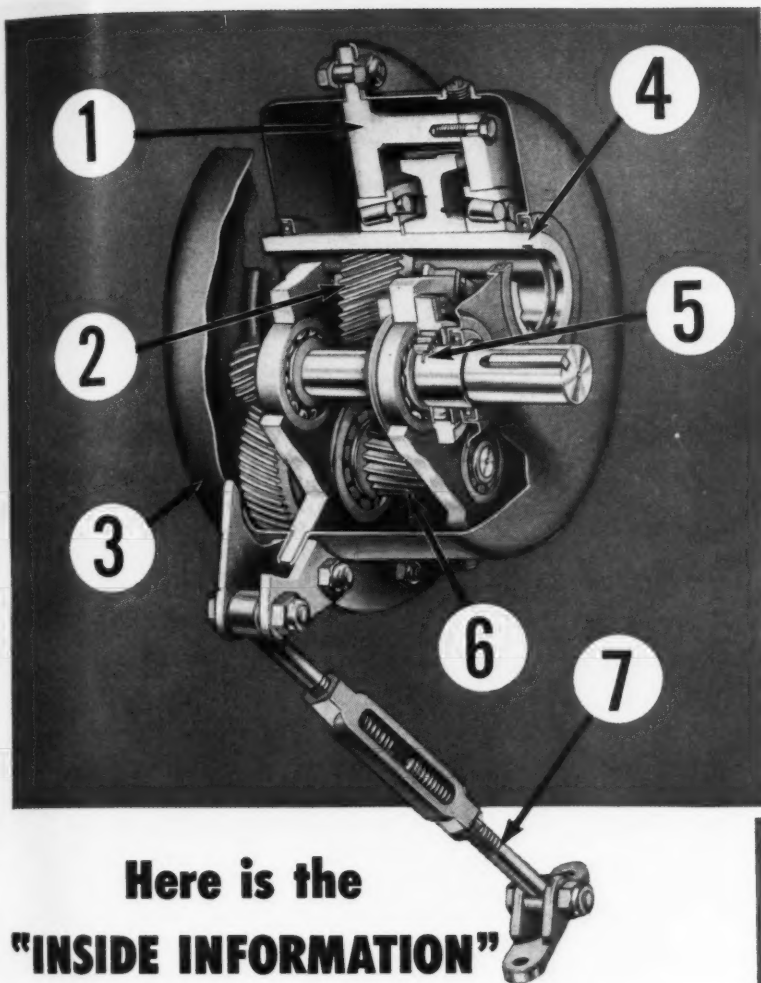
After completing the course, applicants' records are filed and supervisory vacancies are filled by those men who have successfully completed the course. Seniority of service is a consideration in making selections for supervisory jobs, but not the governing factor.

Preliminary test of the plan was made last fall, with 17 men completing the course. Of those men, 13 have since been promoted to permanent supervisory rating. Some sub-foremen took the training at that same time and several promotions have resulted among this group too.

**A NEW SLANT ON PAY FOR EMPLOYEE TRANSFER** is reported by the Industrial Relations Council of Utah. Usually, when an employee is transferred from one city to another, the company pays the expenses of the move, including moving costs for family and household goods. A company now planning to establish a plant in Salt Lake City reports that it also will pay each transferred employee an additional sum equal to 17% of the employee's prior year's earnings. Extra payment is intended to cover such additional expenses as draperies and carpets which do not fit the employee's new home, and added furnishings needed to make the new home suitable.

**NEW PUBLICATIONS ON LABOR** of probable interest to you, some of them free, are the following: **Supplementary Unemployment Pay Plans, West Coast Experiences** is a stenographic brief of a panel report given before the California Personnel Management Assoc. and the Personnel Section of the Western Management Assoc. recently. The panel was chairmanned by Neal Hammond, manager of industrial relations for Ford Motor Co. in California, and the brief includes a booklet describing the Ford supplemental unemployment benefit plan. It's \$1.00 from the Research Div., California Personnel Management Assoc., Farm Credit Bldg., 2180 Milvia St., Berkeley 4, Calif. . . **Guaranteed Annual Wage & Employment Stabilization, a Bibliography** contains an extensive collection of current reference and research sources on this subject. It's also available for \$1.00 from the California Personnel Management Assoc. at address above . . . **AMA Management Bookshelf** is a free catalog of all currently available "best sellers" published by the American Management Assoc. Books listed cover the entire range of good management practice—effective communication on the job, successful production planning, keeping pace with automation, etc. Get your copy by writing to AMA's Publication Service at 1515 Broadway, New York 36, N. Y.





## Here is the "INSIDE INFORMATION" on FALK ALL-STEEL Shaft Mounted Drives

Take a careful look inside the Falk all-steel Shaft Mounted Drive, and you will know why this newest member of the famous Falk family is ideal for applications where direct mounting on the driven shaft is desirable. It is the only drive in its field with all these superior "In-built" factors:—

- 1 All-steel Frame**, with more than double the rigidity of iron, supports all rotating elements.
- 2 Precision Helical Gears**, designed and machined by Falk, rated to AGMA standards.
- 3 Pressed Steel Housings**, whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismantling unit.
- 4 Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.
- 5 Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.
- 6 Positive Lubrication**, continuous direct dip of revolving elements at all speeds.
- 7 Tie Rod and turnbuckle** serve as anchor and facilitate V-belt or chain adjustment.

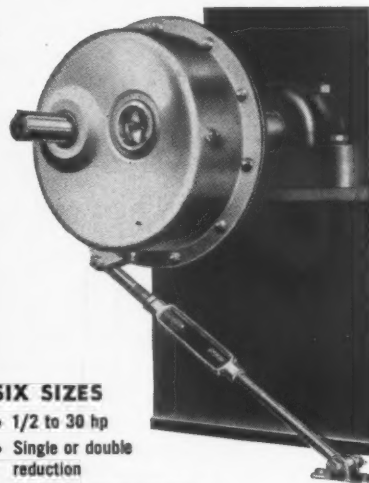
*Write* to Department 247 for engineering bulletin, including selection and dimension details.

THE FALK CORPORATION, Milwaukee 8, Wisconsin

### MANUFACTURERS OF

- |                        |                        |                      |
|------------------------|------------------------|----------------------|
| • Motoreducers         | • High Speed Drives    | • Marine Drives      |
| • Speed Reducers       | • Special Gear Drives  | • Steel Castings     |
| • Flexible Couplings   | • Single Helical Gears | • Weldments          |
| • Shaft Mounted Drives | • Herringbone Gears    | • Contract Machining |

## EFFICIENT SPEED REDUCTION IN LIMITED SPACE

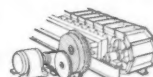


### SIX SIZES

- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm

Expressly designed for topflight performance on installations requiring considerable speed reduction in limited space, the all-steel FALK Shaft Mounted Drive has quickly won acceptance throughout industry. This sturdy, compact, versatile reducing unit is an ingenious variation of the highly successful FALK Motoreducer design, pacemaker in its field for more than 20 years. Here, the time-proved design is adapted for mounting directly on the shaft to be driven, using V-belt connection to motor. Investigate now!

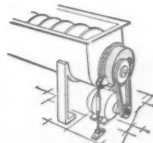
### A FEW TYPICAL APPLICATIONS



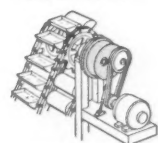
APRON FEEDER



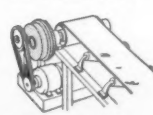
LINE SHAFING



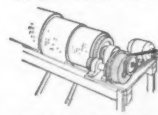
SCREW CONVEYOR



BUCKET ELEVATOR



BELT CONVEYOR



GRAVEL CLASSIFIER

# FALK

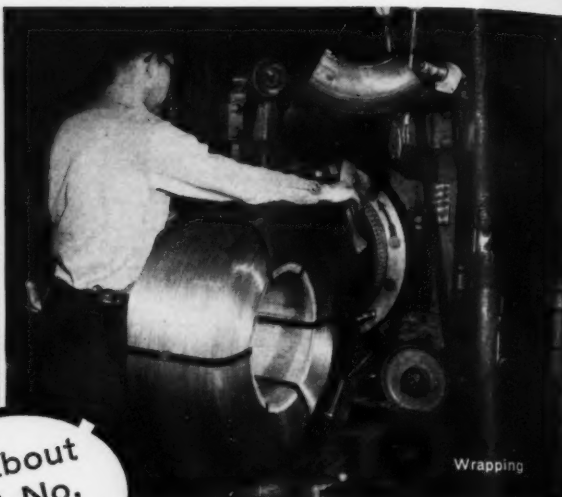
... a good name in industry

... for more details, circle No. 14 on Reader Service Postcard

WESTERN INDUSTRY — August 1956



Strapping Coil



Wrapping

ask about  
IDEA No.  
**S4-4**



Palletizing



Handling

National Standard has patents pending on equipment for this entire operation.

## Check your AIM\* . . . National-Standard did Steel strapping idea cuts two big costs

**NATIONAL-STANDARD COMPANY** of Niles, Michigan, with an important assist from Acme Steel, has cut *shipping* and *handling* costs for its customers in the packaging of tire bead wire.

This wire formerly was shipped on returnable steel reels, for which the customer was charged—then credited when reel was returned. Wire is now wound on a fibre core placed on a collapsible reel. Acme Steel Strapping is applied, reel is dismantled, and coil of wire is ready for wrapping and palletizing. Reel charges are abolished, freight costs to customers are cut, and palletizing with steel strapping is simplifying handling and storage problems.



Acme Idea Man  
Chuck Deerwester  
helped National  
Standard achieve  
these new savings



**\*Check YOUR Acme Idea Man.** He will work with you—give you Acme Steel Strapping ideas to help you with your packaging and shipping problems. Call him at the nearest Acme Steel offices, or write Dept. WCS-86, Acme Steel Products Division, Acme Steel Company, 4903 Pacific Blvd., Los Angeles 58, Calif., San Francisco, Seattle, Portland.

## ACME STEEL STRAPPING

**ACME  
STEEL**

... for more details, circle No. 15 on Reader Service Postcard  
**WESTERN INDUSTRY — August 1956**

# LET'S TAKE A CLOSE LOOK AT LP-GAS

*Here are the advantages:*

## \* LONGER ENGINE LIFE!

Engines have run up to 8,000 hours before major overhaul was necessary.

## \* LOWER MAINTENANCE!

LPG does not dilute crankcase oil, foul spark plugs. You need fewer oil changes, fewer tune-ups, get 5 to 8 times longer oil life.

## \* LOWER FUEL COSTS!

Estimates show that for a 40-hour week, a 10-truck fleet could save from \$30 to \$70 in fuel alone.

## \* NO OBJECTIONAL EXHAUST FUMES!

LPG burns clean, reduces fumes. Ideal for use in warehouses and other enclosed industrial areas.

## \* GREATER OPERATING EFFICIENCY!

You get quieter, smoother operation, higher octane fuel, faster refueling, much less downtime.

## What about safety?

Clark factory installed LPG carburetion systems are fully approved for safety by Underwriters' Laboratories.

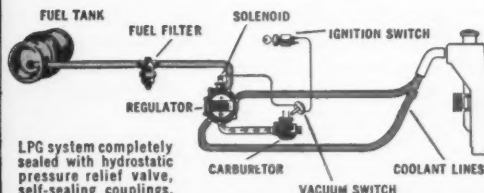
## What's the best system?

Clark's factory installed LPG system is specially engineered from fuel tank to exhaust pipe. Engine is designed for maximum LPG benefits, has higher compression ratio, cold manifold, stellite valves and seats, positive valve rotators. Fuel system is sealed and designed for complete fuel combustion . . . top economy.

## What's available?

Clark offers a complete line of U-L approved LP-Gas trucks in capacities from 2000 to 7000 lbs. Write for details.

See you at the Material Handling Show,  
June 5-8, Cleveland, Ohio!



LPG system completely sealed with hydrostatic pressure relief valve, self-sealing couplings. Safety features: vacuum switch and automatic lock off solenoid.

Industrial Truck Division  
**CLARK EQUIPMENT  
COMPANY**  
Battle Creek 28, Michigan

**CLARK  
EQUIPMENT**



# WESTERN MEETING REPORTS

**UP-TO-DATE INFORMATION ON PROTECTIVE COATINGS** will be offered at a coatings symposium for the West's protective coatings industry scheduled to be conducted by Hercules Powder Co. at the Rodger Young Auditorium in Los Angeles Sept. 11-14. Endorsed by the Los Angeles Paint & Varnish Production Club and the Los Angeles Paint, Varnish & Lacquer Assoc., the symposium will be divided into two sections; first two days will be devoted to discussions of fast-drying industrial finishes based on nitrocellulose and the final two days' discussions will cover chlorinated rubber and silicone finishes.

Two prominent guest speakers will join Hercules' representatives during the four-day session. *Dr. Carl K. Fink*, Carbide & Carbon Chemicals Co., will discuss "Balancing economy and performance when selecting plasticizers and solvents" and *Robert C. Hedlund*, Protective Coatings Laboratory of Dow Corning Corp., will cover "Silicone and silicone alkyd resins for protective coatings." *R. L. Skov*, manager, Cellulose Products Dept., and *William F. Power*, manager, Synthetics Dept., both of Hercules' San Francisco offices, will welcome the group and officially open the symposium at 9:00 the morning of Sept. 11. Advance registration for the no-charge symposium can be made by contacting Hercules' Los Angeles sales office, 3460 Wilshire Blvd., but advance registration is not required.

*(Good pre-symposium fodder and top-quality technology in the field of paints and protective coatings can be obtained from WI's know-how literature section on the subject in the June 1956 issue. Simply check back, use the Reader Service Postcard for that issue, and we will be happy to see that you get your selection quickly.—Ed.)*

**COLORADO CONFERENCE ON LOW-TEMPERATURE ENGINEERING** is for you, particularly if you attended the High Temperature Symposium sponsored by Stanford Research Institute at the University of California late in June. The 1956 Cryogenic Engineering Conference to be held Sept. 5-7 in Boulder, Colo., is not really a place to cool off though. In fact, engineering discussions on a new field such as low-temperature engineering problems usually become heated. Technical papers planned for the session cover such topics as bubble chambers, instrumentation properties of materials, insulation, and cryogenic equipment and processes.

Now, before we burn out a typewriter bearing, we had better pass this data through a heat exchanger and withdraw the cold facts. Cryogenic engineering, a rapidly growing field due to the larger use of liquefied gases such

as hydrogen, oxygen, nitrogen, and helium, was spurred into existence by a need for safer, larger, and more efficient equipment for producing and using the gases. Unusual engineering problems are encountered because of the marked differences in behavior of materials at very low temperatures—below 150 deg. K. (-190 deg. F.)—as compared with ordinary temperatures.

Information regarding registration and reservations may be obtained from *P. L. Barrick* of the National Bureau of Standards Cryogenic Engineering Laboratory, Boulder, Colo.

**NEW PANEL OF OFFICERS FOR AMHS**, No. Calif. Chapter, is headed up by *Harry G. Wood*, supervisor of materials handling at Schlage Lock Co., as president. Other officers include *Ellis H. Wooley*, training officer at Oakland Naval Supply Center, vice president; *Roy C. Brown*, Elder & Co., treasurer; and *William J. Wilkin*, Lykke-Wilkin &



**HARRY G. WOOD**, new president of No. Calif. AMHS, promises a vigorous program of study and exploration projects for the chapter.

Associates, secretary. One of the first steps taken by the new board was to fire a questionnaire to chapter members listing 26 suggested subject topics for meetings and plant tours. Results of this effort are expected to provide a good start toward fulfillment of Mr. Wood's accepting statement: "The year's program will include both study and exploration projects, and field trips for research in the new plants which have recently been opened or are now in construction in the Northern California area. We plan to work with universities as well as with industry in seeking better ways to handle the materials of industry throughout the various channels of their use."

## WESTERN MEETINGS YOU SHOULD PLAN TO ATTEND

**Aug. 21-24—WEST COAST ELECTRONIC MANUFACTURERS' ASSOC. and INSTITUTE OF RADIO ENGINEERS** (seventh region), Western Electronic Show and Convention, Pan-Pacific Auditorium, Los Angeles. Contact Herbert Cerwin, WESCON, 344 N. La Brea Ave., Los Angeles 36, Calif.

**Sept. 10-12—AMERICAN SOCIETY OF MECHANICAL ENGINEERS**, fall meeting, Denver, Colo. Contact A. A. Woodward, Public Service Co. of Colorado, 5525 E. 38th St., Denver.

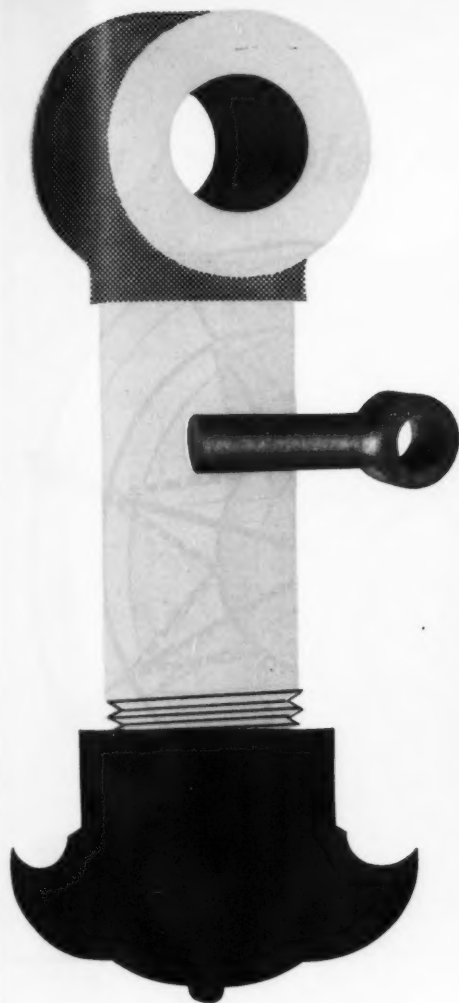
**Sept. 11-13—PACIFIC COAST GAS ASSOC. ANNUAL MEETING**, Hotel del Coronado, Coronado, Calif. Contact Assoc. offices, 2 Pine St., San Francisco 11.

**Sept. 17-21—AMERICAN SOCIETY FOR TESTING MATERIALS**, 2d Pacific Area National Meeting and Apparatus Exhibit, Hotel Statler, Los Angeles. Contact Bert Folda, chairman, promotion and publicity committee, c/o General Petroleum Corp., Box 2122, Terminal Annex, Los Angeles 54.

... continued on page 26



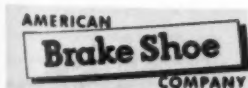
# Which is most important?



a pick-up unit for lifting  
precast concrete walls,  
or a swivel hook  
for the Air Force?

## neither

Both are equally important to us. The eye-bolt part of the pick-up unit and the swivel portion of the hook are examples of AmForge engineering and production. Whenever you have a forging problem, large or small, complicated or simple, AmForge is prepared with engineering assistance and equipment to produce many different sizes and shapes, either press or upset forgings. Please phone us collect when you have a "forging" problem. Phone: EDgewood 4-4931.

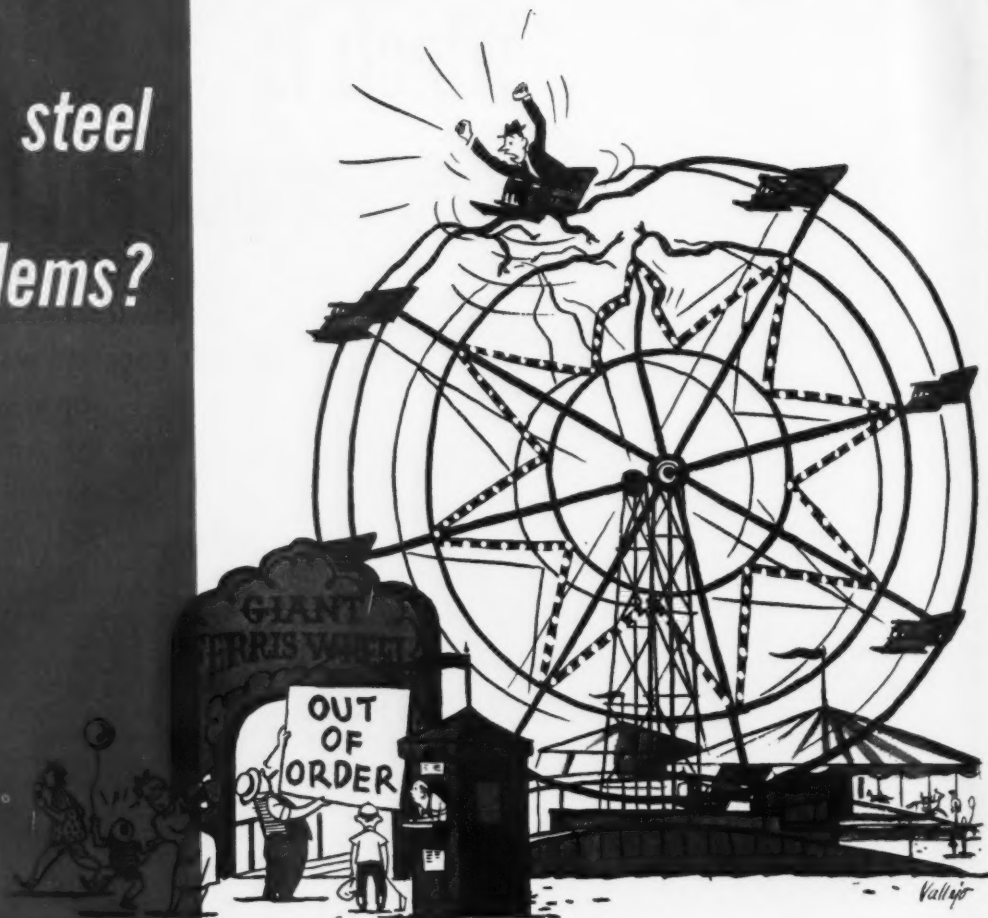


### AMFORGE DIVISION

155 N. WACKER DRIVE, CHICAGO 6, ILLINOIS  
PLANTS: AZUZA, CALIFORNIA • CHICAGO, ILLINOIS

... for more details, circle No. 17 on Reader Service Postcard

*steel  
problems?*



*call Jorgensen first!*

Up in the air with a steel problem? Let Jorgensen bring you back to earth. This company is built on the idea of service—swift, accurate, friendly. Whether your order is small or large, your business is mighty important to us. Yes, you're a Big Wheel at Jorgensen Steel! So whatever you need in steel or aluminum, CALL JORGENSEN FIRST!

## **EARLE M. JORGENSEN CO.**

### **STEEL**

**LOS ANGELES**  
10650 S. Alameda St.  
LOrain 7-1122

**OAKLAND**  
1657 W. Grand Ave.  
HIgate 4-2030

**SAN FRANCISCO**  
700 Pennsylvania Ave.  
MIssion 7-7800

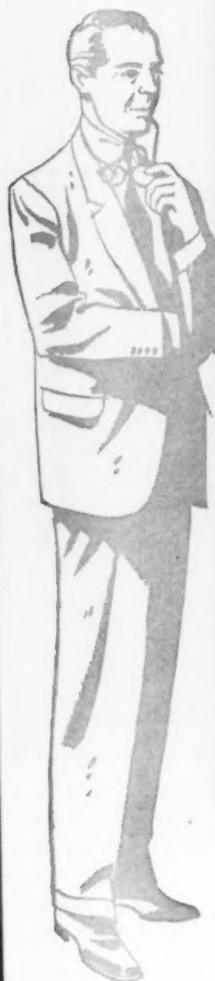
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5311 Clinton Dr.  
ORchard 2-1621

**DALLAS**  
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**TULSA**  
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TEmple 5-1511



# Can a Towmotor Solve My Handling Problems?



**YES!** Towmotor Fork Lift Trucks and Towmotor Job-Planned Accessories are "tailor-made" for your particular application in many ways. Soundly engineered by materials handling specialists, the Towmotor line includes 15 different models and more than 60 interchangeable attachments, for every handling need.

Ask your nearest Towmotor Representative to show you what Towmotor equipment can do to speed your materials handling, cut man-hour costs and make maximum use of storage space! . . . or write for Certified Job Studies covering your industry. TOWMOTOR CORPORATION, Div. 6708, 1226 E. 152nd St., Cleveland 10, Ohio.

Read how other companies use Towmotor Equipment to Cut Costs!

Brick Manufacturer: Ask for Job Study #107

Cotton Warehouse: Ask for Job Study #109

Transfer Company: Ask for Job Study #111

Fruit Grower: Ask for Job Study #110

Metals Plant: Ask for Job Study #108

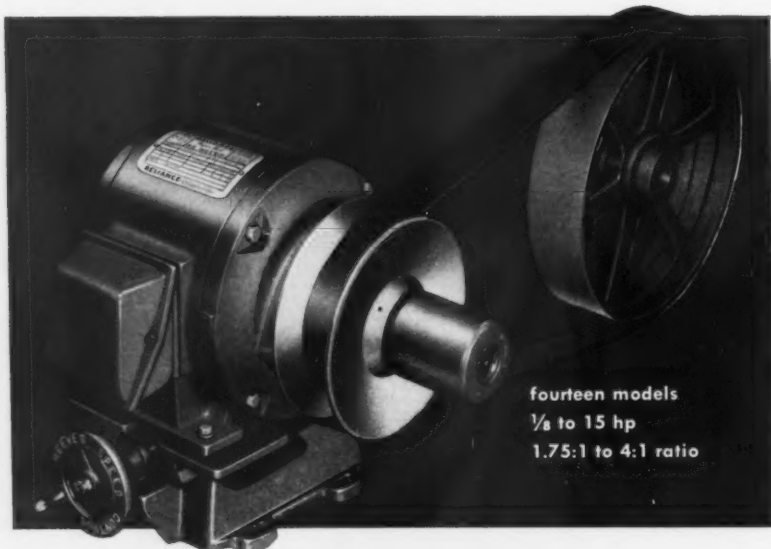
America's best engineered fork lift truck

**TOWMOTOR**  
THE ONE-MAN-GANG®

THERE'S ONLY ONE FORK LIFT TRUCK CALLED TOWMOTOR

... for more details, circle No. 19 on Reader Service Postcard

**The low-cost answer to  
wider use of your machines**

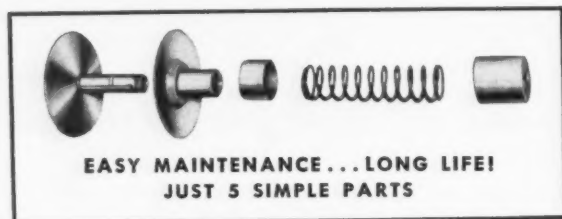


fourteen models  
1/8 to 15 hp  
1.75:1 to 4:1 ratio

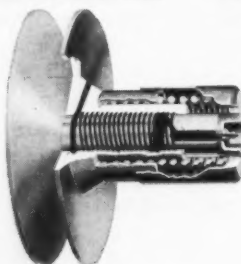
# REEVES

## Vari-Speed Motor Pulley

✱ Add the advantages of accurate variable speed control to your existing machinery with this compact unit. Add versatility and extended life... handle more shapes, sizes and materials!



REEVES "Close-grooving"  
—a special lubrication  
system—insures free slid-  
ing disc for easy speed  
changes.



✱ For bulletin complete with rating charts and dimensions, write Dept. 21-V545.

REEVES DIVISION  
**RELIANCE ELECTRIC AND  
ENGINEERING CO.**  
1525 ADRIAN ROAD, BURLINGAME, CAL.

... for more details, circle No. 20 on Reader Service Postcard

## WESTERN MEETINGS

... continued  
from page 22

**Sept. 17-21—SYMPOSIUM ON RADIATION EFFECTS ON MATERIALS**, sponsored jointly by Atomic Industrial Forum and American Society for Testing Materials, **Los Angeles**. Contact ASTM, 1916 Race St., Philadelphia 2, Pa.

**Sept. 19-21—PORCELAIN ENAMEL INSTITUTE, INC.**, 25th annual meeting, The Broadmoor, **Colorado Springs, Colo.** Contact Porcelain Enamel Institute, 1145 19th St. N.W., Washington 6, D. C.

**Sept. 23-29—NATIONAL ASSOC. OF ELECTRICAL CONTRACTORS**, national convention, **San Francisco**. Contact Clint J. Harder, secretary-treasurer, 1200 18th St., N.W., Washington 6, D. C.

**Sept. 26-28—AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS**, 33rd annual Rocky Mountain Minerals Conference, Newhouse Hotel, **Salt Lake City**. Contact R. B. Coleman, 600 W. 33rd So., Salt Lake City, Utah.

**Oct. 1-4—AMERICAN MINING CONGRESS** (Metal Mining-Industrial Minerals Convention and Exposition), Shrine Exposition Hall, **Los Angeles**. Contact American Mining Congress, Ring Bldg., Washington, D. C.

**Oct. 16-18—35TH PACIFIC COAST MANAGEMENT CONFERENCE**, "Building the Management Team," practical company experience used to get strong team results on principal levels of management, **Claremont Hotel, Berkeley, Calif.** Contact California Personnel Management Assoc., 2180 Milvia St., Berkeley.

**Oct. 31-Nov. 1—1956 WESTERN AREA DEVELOPMENT CONFERENCE**, "Resources for Industrial Expansion" theme, co-sponsored by Stanford Research Institute and Confederación de Camaras Industriales de los Estados Unidos Mexicanos (a Mexican industrial association), Hotel Westward Ho, **Phoenix, Ariz.** Contact Charles L. Hamman, Assistant Director, Economics Research, Stanford Research Institute, Menlo Park, Calif.

**Nov. 1-3—NEW MEXICO MINING ASSOC.**, convention, **Carlsbad, N. Mex.** Contact J. B. Knaebel, president, P. O. Box 1125, Santa Fe, N. Mex.

**Nov. 9-10—AMERICAN IRON & STEEL INSTITUTE**, regional convention, **San Francisco**. Contact Frank Raglan, secretary, 350 Fifth Ave. New York, N.Y.

**Nov. 12-14—PACIFIC LOGGING CONGRESS**, **San Francisco**. Contact Carwin A. Woolley, 1222 American Bank Bldg., Portland 5, Ore.

**Nov. 30-Dec. 1—NORTHWEST MINING ASSOC. CONFERENCE**, Davenport Hotel, **Spokane, Wash.** Contact Karl Jasper, Radio Control Bldg., Spokane.

1957

**Mar. 25-29—AMERICAN SOCIETY FOR METALS**, tenth Western Metal Exposition and Congress, Pan-Pacific Auditorium and Ambassador Hotel, **Los Angeles**. Contact W. H. Eisenman, managing director, 7301 Euclid Ave., Cleveland 3, Ohio.



# FREE

CHASE BRASS & COPPER CO. Dept. WI-856  
Waterbury 20, Conn.

Gentlemen:

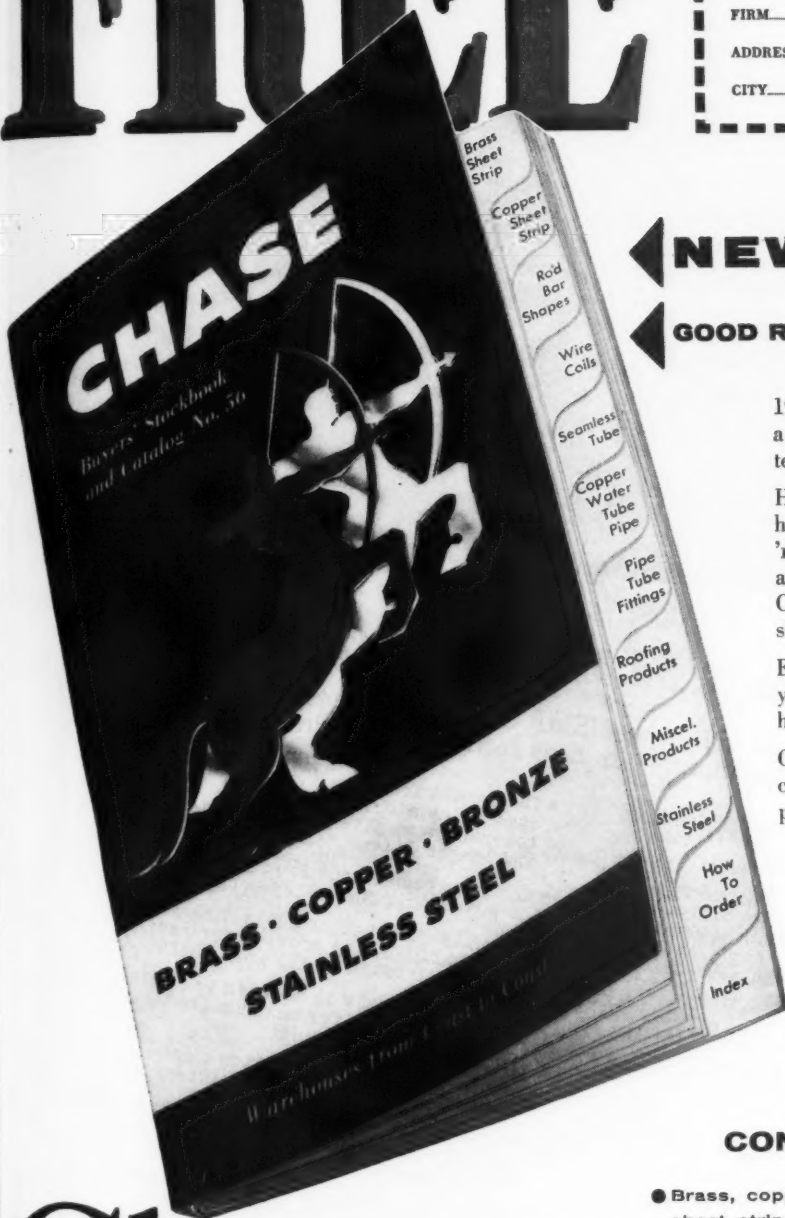
Please send me your free 192-page Buyers Stock Book and Catalog No. 56.

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**GOOD READING FOR METAL MEN!**

192 pages of illustrations and listings of a variety of products...sizes...weights...temper...shapes!

Here's the latest enlarged edition of a handy desk-sized book you'll use all year 'round! It lists the brass, copper, bronze and stainless steel mill forms carried in Chase warehouse stocks—ready for quick shipment to you!

Everything about it is designed to save you time, from its thumb-indexing to a headache-saving *how-to-order* section.

Comes to you *free* from Chase. Get your copy by filling out and mailing the coupon above. Do it today!

## CONTENTS INCLUDE:

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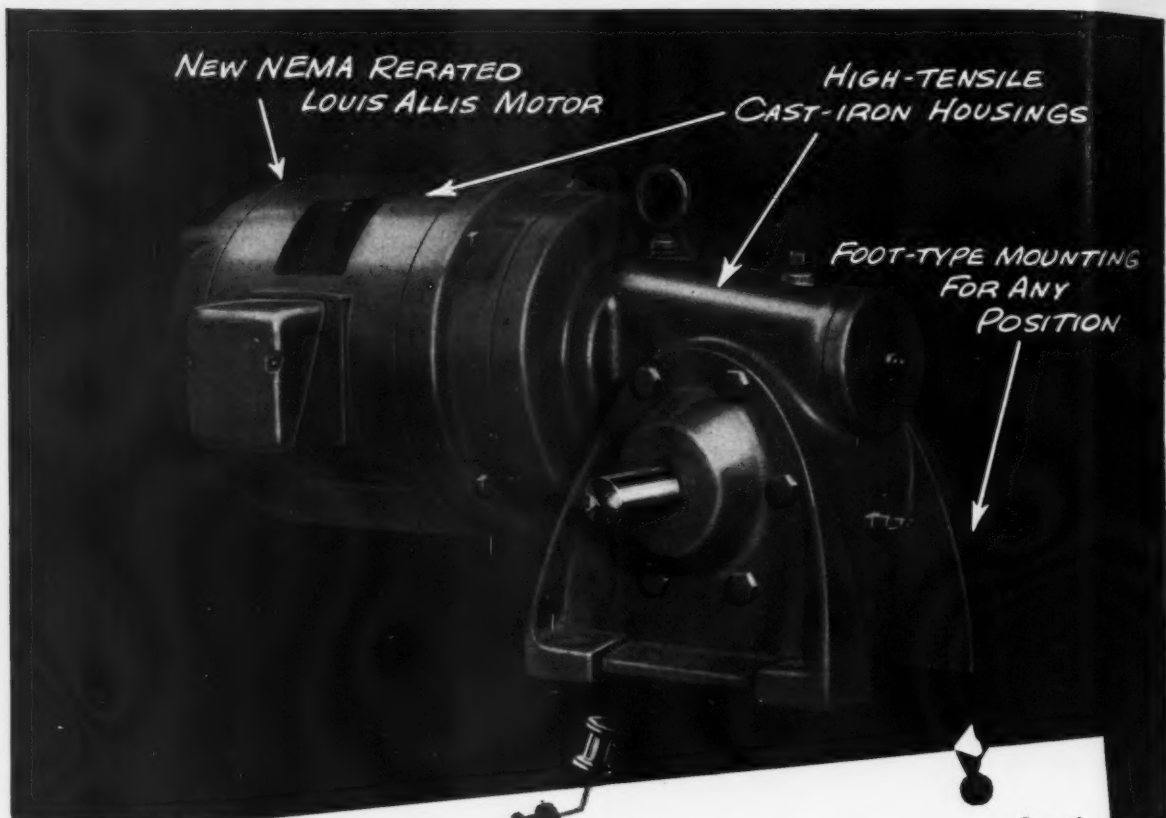
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HOUSTON 1, TEXAS ..... 16 Drennen St., Tel. CApital 2-7266

DENVER 16, COLO. .... 5101 Colorado Blvd., Tel. DUdley 8-2441

... for more details, circle No. 21 on Reader Service Postcard

WESTERN INDUSTRY — August 1956



## *Louis Allis announces its L.A. line of right-angle gearmotors*

Now available with new NEMA rerated L.A. motors for all applications — in sizes from 1/3 to 30 hp

Before we go into the many design features of this compact gearmotor, let's take a look at a few other advantages:

First of all, you can get either foot- or flange-mounted units. Secondly, you can have any motor enclosure you want. And finally, you can have any electrical or mechanical modification needed for any specific application.

In other words, here's a line of gearmotors ruggedly designed, versatile and efficient—to give you a sound answer to your right-angle gearmotor drive problems. Here's why:

- Both gear and motor housings are made of high-tensile cast iron to provide maximum strength, rigidity, and compactness.

- The worm, carefully machined from hardened alloy steel, is ground to close tolerances to give greater efficiency and longer life.
- The worm gear is cut from a high grade of wear-resistant alloy bronze.
- A double-row angular contact bearing and a ball bearing provide for radial and thrust loads on the worm shaft.
- The output shaft is mounted in tapered roller bearings for maximum load-carrying capacity.
- Ample oil-bath lubrication assures longer life and minimum maintenance.
- Special oil seals on all shafts keep the oil in--dirt out and permit any mounting arrangement.

Here's a line of right-angle gearmotors that's very easy to apply. Standard speed range from 7-1/2 to 300 rpm--special speeds also are available.



Flange-mounted right-angle gearmotor with new L.A. line explosion-proof motor

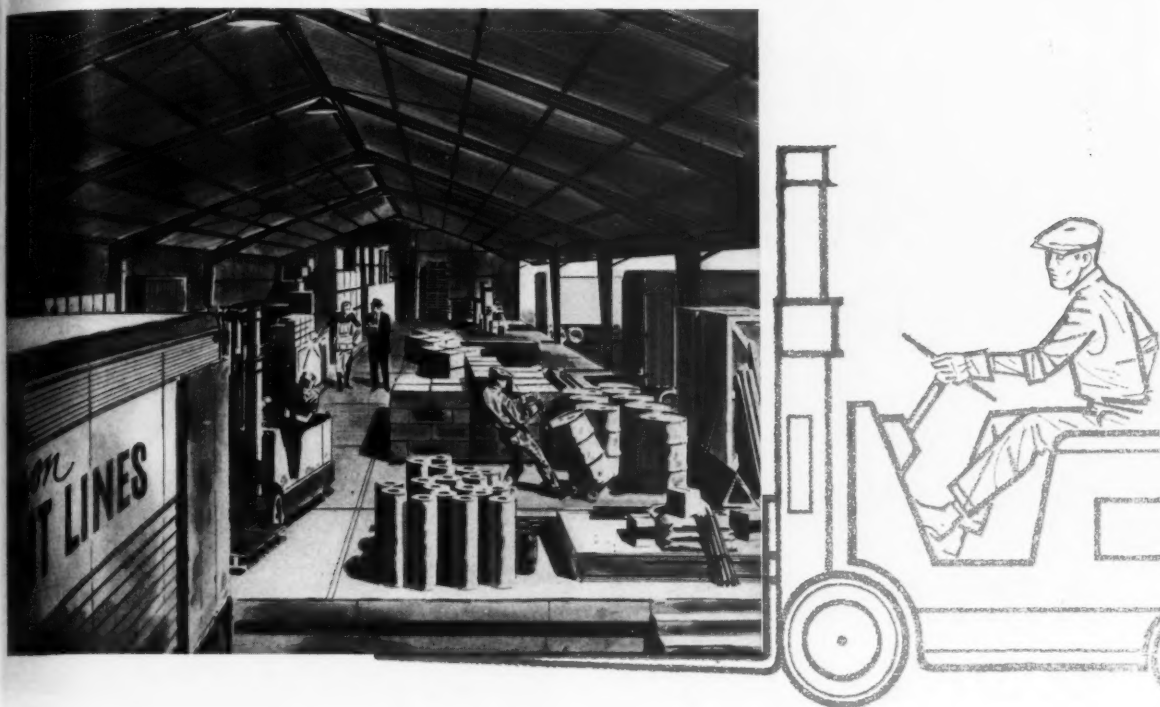


**THE LOUIS ALLIS CO.**

MILWAUKEE 7, WISCONSIN

... for more details, circle No. 22 on Reader Service Postcard  
WESTERN INDUSTRY — August 1956

## Clear-Span, Low-Cost Soulé Buildings



### For Fast, Economical MATERIALS HANDLING

Whether you're working with bulk or packaged commodities,  
you can cut handling and warehousing costs with clear-span Soulé  
Buildings. Clear-span means there are no interior support columns  
to waste storage space or hinder mechanical handling of goods.  
Every cubic foot of a Soulé Building is usable. And more usable  
building space for your dollar, combined with Soulé standardized  
design and mass-production of building parts brings you big cost  
savings compared to conventional concrete or brick construction.  
You can't buy a more efficient, practical business structure.

**CALL OR WRITE FOR CATALOG, PRICES ON SOULÉ BUILDINGS**

**Soulé**

LEADER IN STEEL BUILDINGS

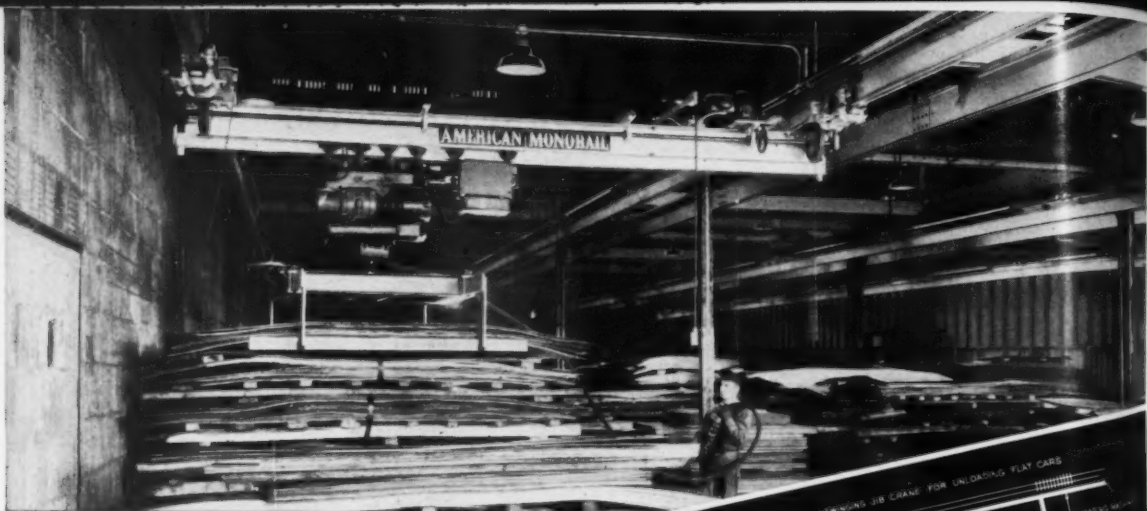
INDUSTRY  
AGRICULTURE  
COMMERCE

### SOULÉ STEEL COMPANY

Department J

San Francisco 1750 Army Street, VAlencia 4-4141  
Los Angeles 6200 Wilmington Avenue, LUdlow 5-0911  
San Diego 3741 Fifth Avenue, CYpress 5-6289  
Fresno 850 R Street, FResno 4-6930  
Portland 2630 N. W. St. Helens Road, CApital 3-5154  
Seattle 4100 West Marginal Way, HOLly 3600  
Spokane 405 American Legion Building, MADison 6000  
Phoenix 2026 South 11th Avenue, ALPine 3-3178  
Salt Lake City 220 Greyhound Building, EMpire 3-7601

... for more details, circle No. 23 on Reader Service Postcard



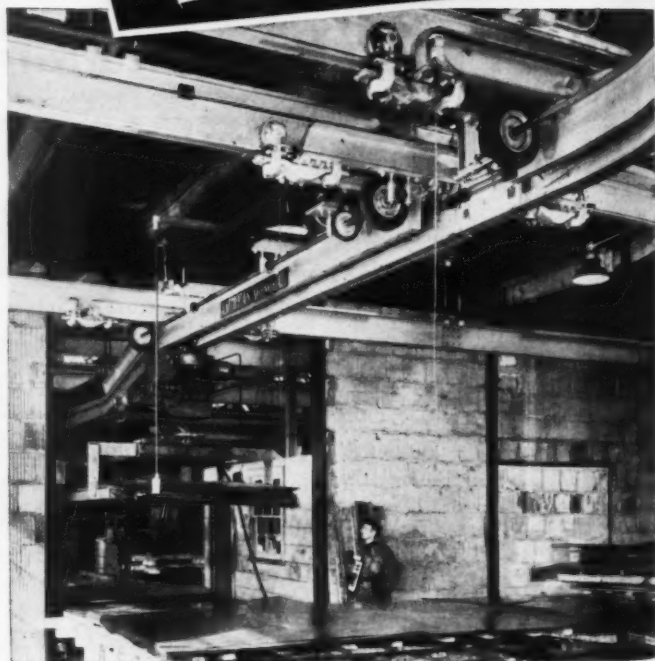
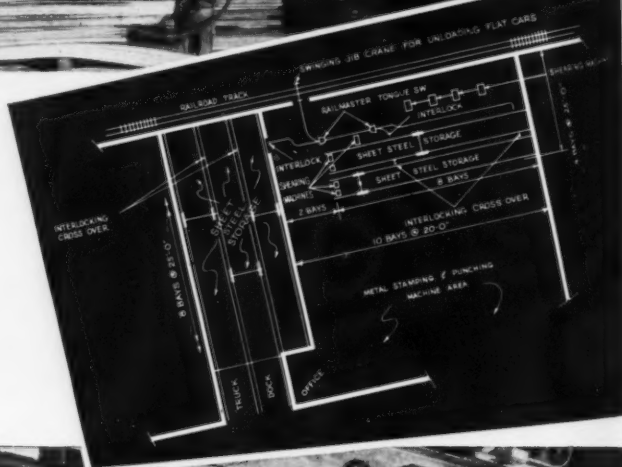
handles **200** tons  
more steel per day  
with  
**AMERICAN  
MONORAIL**

The Hamilton Steel Products Company of Chicago now handles 250 tons of sheet steel per day with American MonoRail cranes as compared to 50 tons by previous methods. An increase of 400%.

This is just another example of cost savings with improved handling methods which are regularly realized by American MonoRail users. If you have a materials handling problem call your American MonoRail representative or write us today.

Send for Bulletin SC-1.

Member of Materials Handling Institute and  
MonoRail Association



**AMERICAN MonoRail COMPANY**

[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

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337 Pittcock Block

13117 ATHENS AVENUE  
CLEVELAND 7, OHIO

... for more details, circle No. 24 on Reader Service Postcard

WESTERN INDUSTRY — August 1956



# Can one grease tackle all these greasing problems?



Yes . . . and here's how—with the  
help of Shell men and techniques

Shell men knew plant operators *needed* a multi-purpose grease—to simplify inventory problems, to cut greasing errors. But could one be formulated that would withstand such adverse conditions as *heat, moisture, and low-temperature operation?*

Shell Research men set to work to find out. After extensive testing they developed SHELL ALVANIA GREASE, the revolutionary new multi-purpose lubricant.

Put to the most severe tests, Shell Alvania withstands *both* high and low temperatures, as well as wet operation (Alvania is water resistant and inhibits corrosion).

Because of its outstanding mechanical and oxidation stability, Alvania stays in the bearings longer, extends time between greasings. And because it serves for practically every application in most plants, Alvania can help you reduce grease costs and greasing errors.

Alvania Grease is just one of many fine products developed by Shell's 1500-man research team—a team with 25 years' experience in lubrication problems.

A telephone call can put this team to work solving your special problems. Why not call in your Shell representative today?



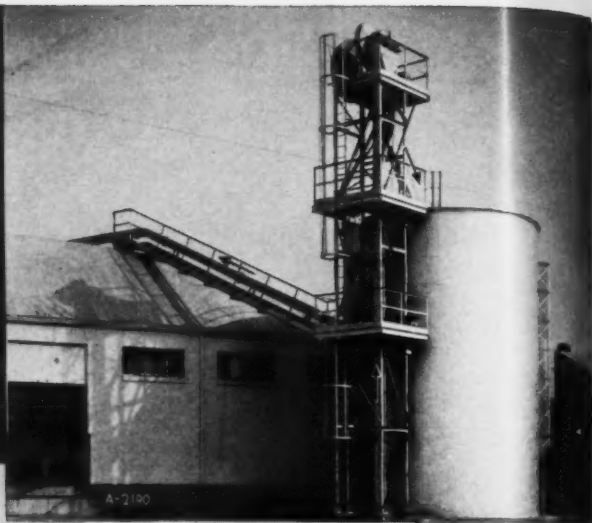
## SHELL ALVANIA GREASE

... for more details, circle No. 25 on Reader Service Postcard

# MAKING "Rain Drops" the BUTAY WAY...



This 5-inch Redler conveyor on roof receives material from the 30 ft. inclined Redler and in turn carries it 51 ft. to the point of discharge into plant (right foreground).



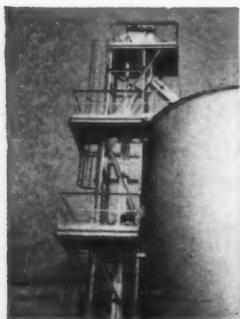
Outside Redler elevates material from track hopper to discharge either at storage tank or to 30 ft. inclined conveyor which in turn delivers to a horizontal conveyor on the plant roof.

## WITH AN S-A ENGINEERED BULK MATERIAL HANDLING SYSTEM!

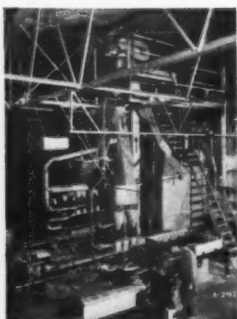
Manufactured by the Butay Products Company, Los Angeles, "RAIN DROPS" is a water softening and blueing agent. To provide swift, economical conveying and mixing of this product's base ingredient, Stephens-Adamson engineered a system which saves many costly material handling hours.

Completely automated, this system consists of a batch skip, mixer unit, and L-type sealed casing Redler conveyors which eliminate all dusting problems. From the point of delivery outside the plant to the packaged product itself, raw material moves swiftly and smoothly by 100% mechanical means.

The Butay installation is an outstanding example of Stephens-Adamson overall planning. More than 50 years' experience in designing and manufacturing equipment that conveys at lowest cost per ton qualifies S-A for any assignment in mass movement of bulk material.



Close-up view of Redler elevator showing double leg at head end, assuring perfect discharge. Discharge is to storage or to roof conveyor. Rate 10 tons per hour. Sealed casing of Redler permits outside operation without housing.



Complexity of layout is illustrated by this interior processing station photo. Skip delivers to mixer which dumps to hopper feeding L type Redler. Mix is then delivered to packaging machine or to storage.

There is an S-A sales engineer in your area. Contact him for sound advice in your conveying problems.



### STEPHENS-ADAMSON MFG. CO.

85 Ridgeway Ave., Aurora, Ill.  
Los Angeles, Calif. — Belleville, Ontario

#### ENGINEERING DIVISION

Designers and manufacturers of all types of bulk materials conveying systems.

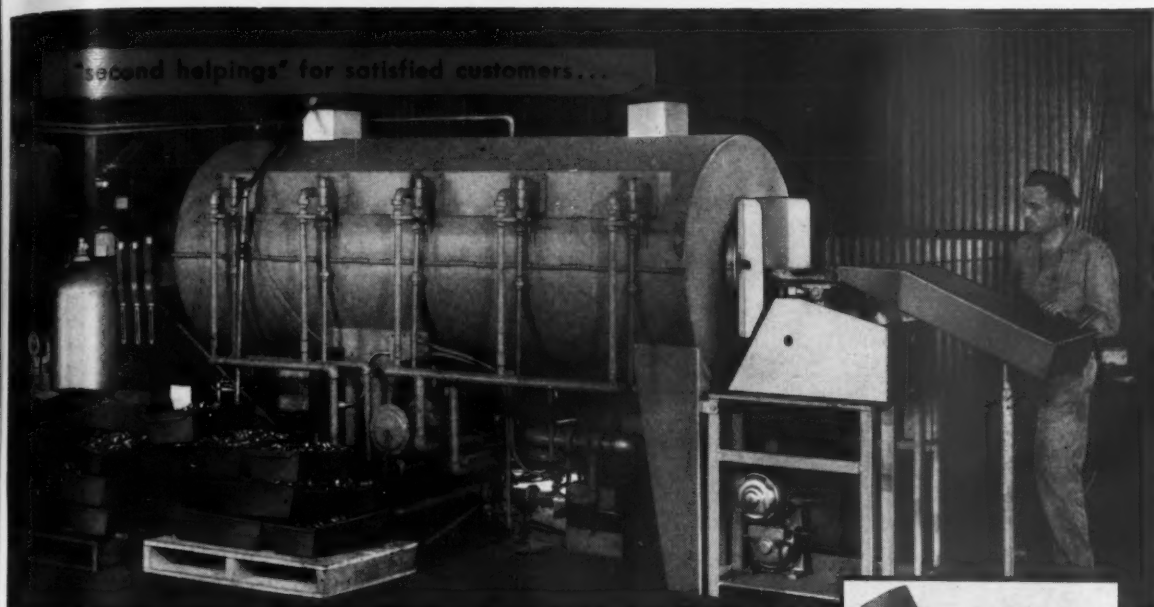
#### STANDARD PRODUCTS DIVISION

A complete line of conveyor accessories—centrifugal loaders—car pullers—bin level controls, etc.

#### SEALMASTER DIVISION

A full line of industrial ball bearing units available in both standard and special loadings.

... for more details, circle No. 26 on Reader Service Postcard  
WESTERN INDUSTRY — August 1956



## "OUTSTANDING PERFORMANCE"

THAT'S WHY VALLEY HEAT TREATING CO.

CAME BACK FOR ANOTHER

# \*Pacific-built furnace!

When a heat treating customer is willing to pay a premium price to get the quality he needs, you can be pretty sure he can't afford many rejects.

That was the case with one of Valley Heat Treating Company's customers who selected them because their rigid specifications could be met without expensive rejects. The amazing part of the story is that Valley was actually able to lower their cost by 15% while they still met these specifications!

Much of the credit must go to Valley's new Pacific Gas-fired Shaker Hearth Furnace. This furnace provided a combination of fast and economical operation with extremely uniform control of the work.

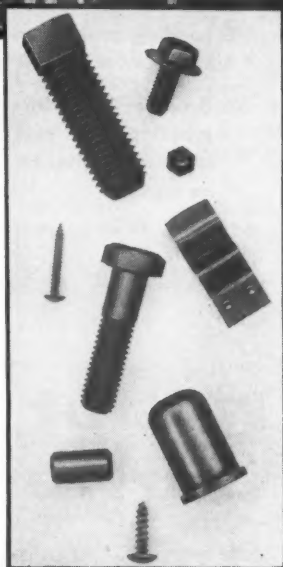
Rated at 500 pounds per hour, this new Pacific Furnace is used for Carbo-nitriding and scale-free neutral hardening. It permits maximum

hardness of all parts, and the 14" wide Inconel hearth with Pacific's exclusive shaker design allows a wide variety of work to be handled without damage to the parts.

According to Valley, their work comes out exceptionally clean, requiring only washing before delivery, and case depth is easily controlled due to Pacific's uniform-heating burner design.

This profitable performance is the reason Valley has installed two different types of Pacific Furnace, and has recently ordered a third!

For more information on a Pacific Furnace for your heat treating job, whatever it is, write today!



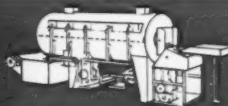
Typical of the wide range of parts handled in this furnace.

# Pacific

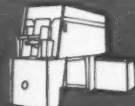
INDUSTRIAL  
HEAT TREATING  
EQUIPMENT

PACIFIC  
SCIENTIFIC  
COMPANY

LOS ANGELES  
SAN FRANCISCO  
SEATTLE  
PORTLAND, OREGON  
ARLINGTON, TEXAS



GAS-FIRED  
OR  
ELECTRIC



PACIFIC SCIENTIFIC CO. P. O. Box 22019, Los Angeles, California

Please send me  
bulletins and  
specifications  
on a Pacific  
Furnace for:

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

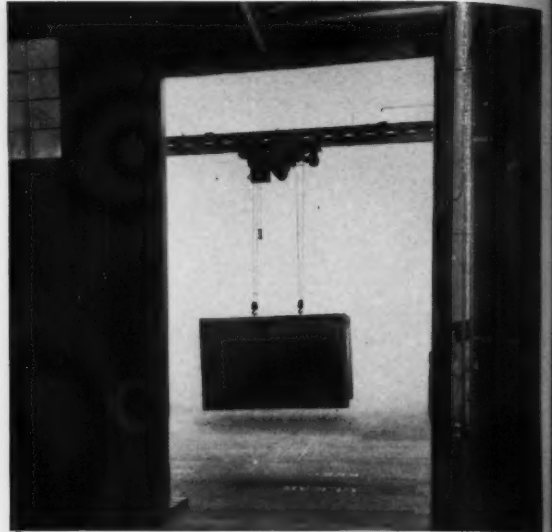
(type of work)

City \_\_\_\_\_ State \_\_\_\_\_



1.

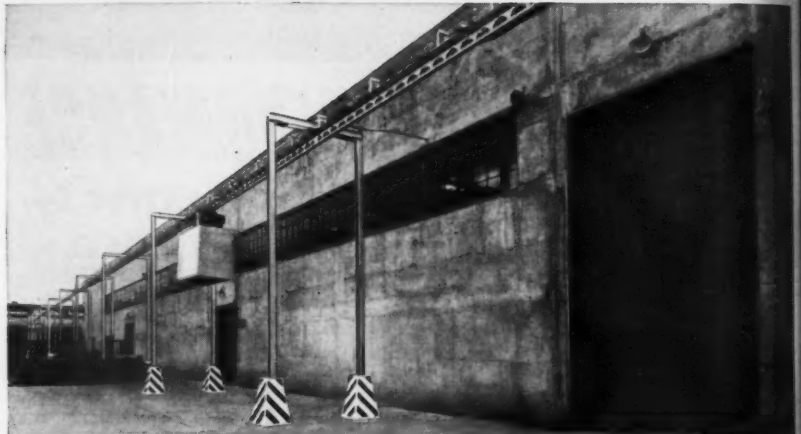
1. Loading carrier van with power truck.



2.

2. Up she goes. Depressing wall button sends carrier on its way.

3. En route to another building.



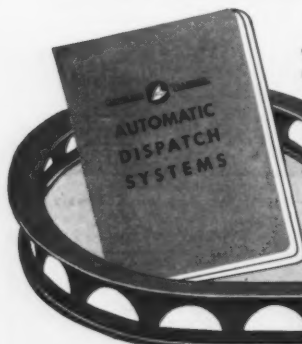
3.

## Robot Carrier Delivers Materials Automatically

**W**ITH a Cleveland Tramrail Robot Carrier, it is no problem to move materials between buildings. Heavy loads can be dispatched great distances without operators, safely, at low cost. The equipment opens and closes doors,

if necessary, and stops automatically upon reaching the selected delivery point.

Cleveland Tramrail has developed a wide variety of automatic materials handling equipment which is now in service providing tremendous savings.



**GET THIS SPECIAL REPORT**  
Write us for your free copy of  
"AUTOMATIC DISPATCH PORTFOLIO"  
Gives data on a variety of cost-reducing  
automatic handling installations.

**CLEVELAND TRAMRAIL DIVISION**  
**THE CLEVELAND CRANE & ENGINEERING CO.**  
8809 East 290th Street, Wickliffe, Ohio

**CLEVELAND**  **TRAMRAIL**  
**OVERHEAD MATERIALS HANDLING EQUIPMENT**



NEW CUSTOMER-IMPROVED

## General Electric Pacific '55' Gear-Motor

### Simplifies Speed Changes, Handles More Applications

Completely redesigned to meet the increased demands being placed on modern industry, G.E.'s new Pacific '55' Gear-motor incorporates the many advances gained from over 25 years experience in gear-motor design and application. Simplified design of this packaged low-speed drive provides far greater versatility.

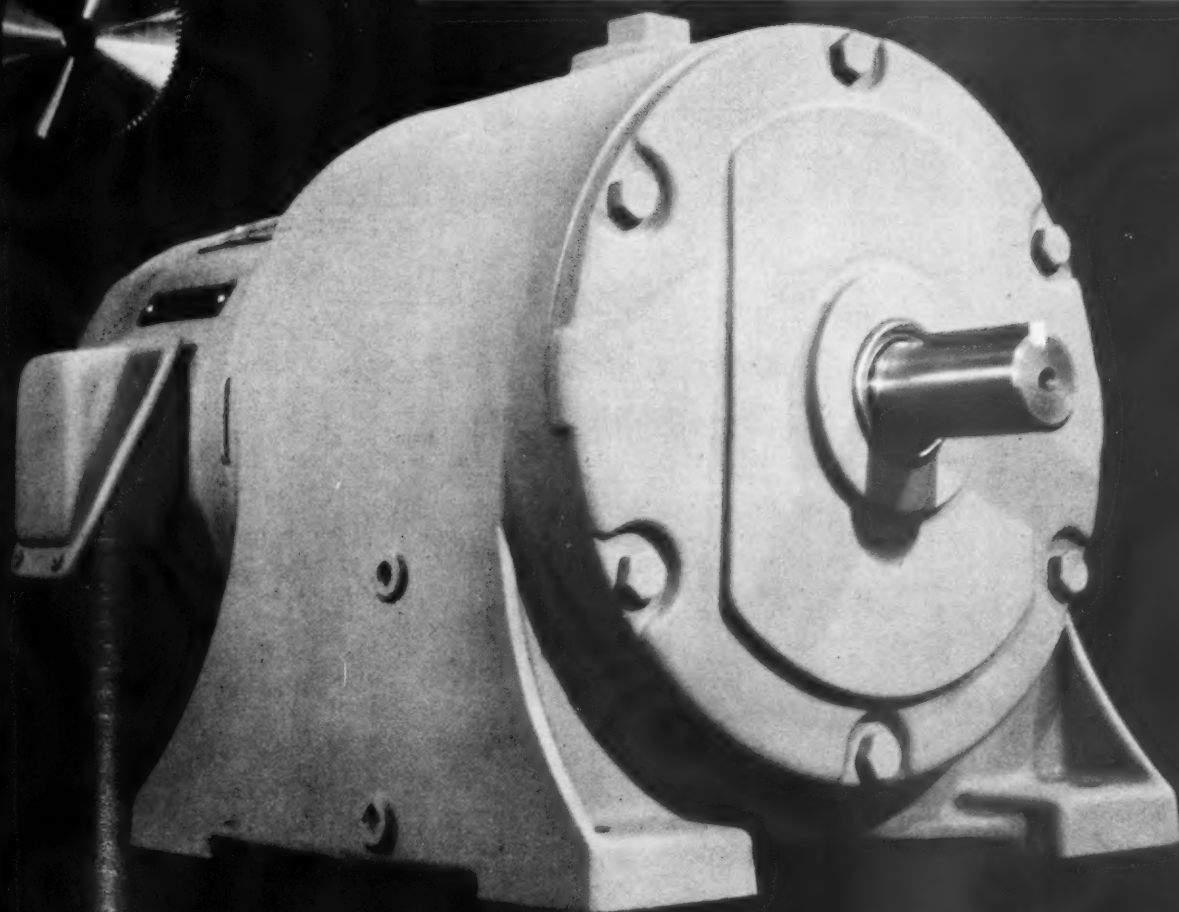
**GREATER FLEXIBILITY:** Motor can be replaced in minutes without disconnecting gear unit from load. The new Series "N" unit accommodates any G-E NEMA standard motor in the same frame size or horsepower.

**LONGER LIFE:** Double protective seals keep lubricant in—dirt out; concentricity of bearing bores assures precision line-up of gears.

**REDUCED MAINTENANCE:** New unit can be disassembled in three steps; breather and filler hole are combined for fast inspection.

**NEW G-E PACIFIC '55' GEAR-MOTORS** are now available from 1-5 hp, 520 to 13.5 rpm. Other ratings up to 50 hp will be available soon.

**FOR MORE INFORMATION** on the new Pacific '55' Gear-motor line, write for Bulletin GEA-6487, Section 852-1, General Electric Company, 235 Montgomery Street, San Francisco, California, or contact your nearest G-E Sales Office or authorized gear-motor supplier.



GENERAL  ELECTRIC



## 3 kinds of help on sheet and strip steel

Sheet and strip buyers tell us that three kinds of purchasing help keep them coming back to Ryerson:

**1. WIDER SELECTION OF TYPES**—More than 20 kinds of sheet and coil stock are on hand in an unusually wide range of gauges—making it easier to get the exact steel needed for any requirement.

**2. GREATER PROCESSING CAPACITY**—The most extensive cutting and processing facilities in the steel-service industry enable buyers to get quickest service on requirements for special sizes, strip and sketch cutting, blanks, slit coils, edging, or any other processing.

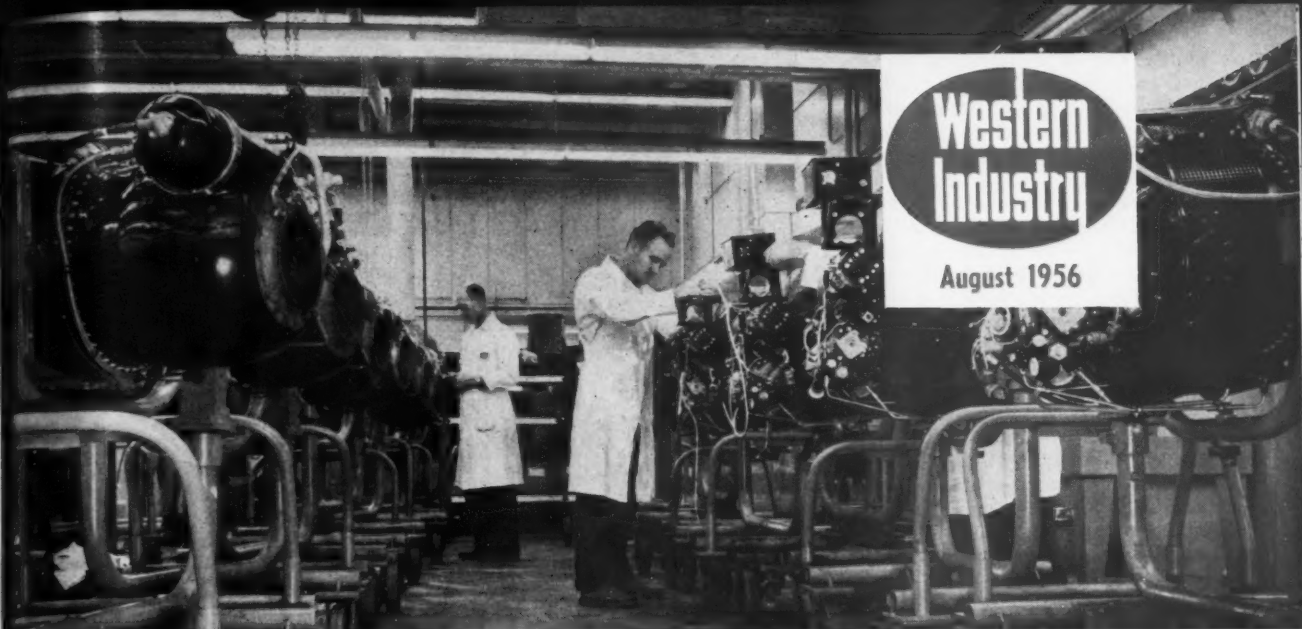
**3. HELP ON SHEET AND STRIP PROBLEMS**—The large Ryerson staff of sheet and strip specialists gives buyers a valuable source of help in selecting the most satisfactory and economical stock—or in solving any other problem of application and fabrication.

In addition, sheet and strip buyers like the good packaging, the dependable weight and on-schedule delivery that they get from Ryerson—and the convenience of one-order buying of all steel products from the same source. So call your nearby Ryerson plant for 3-way help on sheet and strip needs.

## RYERSON STEEL

**PRINCIPAL PRODUCTS:** Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing, industrial plastics, machinery & tools, etc.

**JOSEPH T. RYERSON & SON, INC., LOS ANGELES**—Plant: 4310 E. Bandini Blvd. Mail: Box 3817, Los Angeles 54. Phones: ANgelus 2-6141, from San Diego (no toll) Zenith 6660. **SAN FRANCISCO**—Plant: 65th & Hollis Sts., Emeryville. Mail: Box 188, Emeryville, California. Phones: Olympic 3-2933, Douglas 2-4211. **SEATTLE**—Plant: 1200 4th Ave., South. Mail: Box 3525, Seattle 24. Phone: Seneca 2300. **SPOKANE**—Plant: North 207 Freya St. Mail: Box 2158, Spokane 10. Phone Keystone 5-1581.



**TO ELIMINATE STRAIN INJURY** on the assembly line, AiResearch devised and built these special carts to handle turbine motors. Units remain on the carts through assembly, inspection, testing and all the way to shipping.

## A safety program from scratch

*... and how well AiResearch did it is proved by sharp accident cost drop and blue-ribbon safety honors during 20-fold plant expansion.*

**H**OW TO start a safety program from scratch—that was the question facing AiResearch Manufacturing Co., a division of the Garrett Corp., in August 1951 when it opened its Phoenix, Ariz., plant. With production, assembly, and test facilities designed to produce small gas turbines, air turbine drives, pneumatic valves and controls, and electronics equipment for military and civilian aircraft, the new but small plant was planned with expansion in mind. How rapidly this growth was to come about could not be anticipated.

### Individualized at the start

At the start, safety was a function of the AiResearch personnel department and, naturally enough, was approached from an individual employee angle rather than as part of a planned, overall campaign. A talk on safe job practice was given to a new employee when he reported for work and from there it became the duty of supervision to instruct and enforce safety rules. In the rush of getting its initial 170 employees into production, it was

nearly 10 mo. and 500 employees later in May 1952 when safety was made the responsibility of an industrial relations staff member and began to assume the form of a definite program.

### Steps in formalizing program

As a first step toward a safety program, procedure for the accurate reporting and recording of accidents was given top priority. Lack of such information had proved a serious handicap for the infant program. More

immediately a supply of personal safety equipment was ordered, a poster campaign stressing safety launched, and a technical library started.

The following month a safety committee of employees was formed and assigned the task of reporting unsafe conditions and practices. This employee committee was designed to represent all phases of the firm's aircraft accessories manufacturing operations. Starting with its original five members, it has expanded to a present 21 member group representing three

**UNIQUE EMPLOYEE-RUN COMMITTEE** makes suggestions and has final authority on plant's safety methods and procedures. Part of 21-man group (7 from each of 3 shifts) meets with safety administrator Evan Stallcup (r).





shifts. The organization is perhaps unique in that it is entirely employee run, each employee appointing his own successor at the end of a one-year term. The group functions under the guidance of the safety office, but final authority on safety method and procedure rests only with the committee. This idea of supervision acting in an advisory capacity with the employee establishing policy is basic AiResearch practice in the personnel field.

### Employment doubles, effort steps up

With a work force which had nearly doubled in size to 1,150, in early 1953 safety went on a full-time basis with the hiring of a former Arizona Industrial Commission safety engineer. A short while later the AiResearch industrial insurance program was altered to the "self-rater" type in which the company directly benefits from any reduction in accident costs, and the firm entered into national safety competition with other manufacturers in similar fields.

AiResearch at this time began its offer of prescription safety glasses at no expense to the employee. With a prescription form signed by a doctor, the employee was sent to a local optometrist where lens were ground and frames fitted and later adjusted if needed. Any employee in an eye-hazard job who needs the special aids is eligible under the company paid plan. It has and remains AiResearch policy, as established by the safety committee, to encourage the use of safety glasses by all persuasive means but to leave the final decision to each individual worker on a voluntary basis.

In an effort to bring employee participation and interest into the campaign a safety slogan contest was started and widely promoted. Over a 10-wk. period, paychecks bore the prize winning mottos and a "mystery quizzer" circulated awarding \$2 bills to employees who could correctly repeat that week's slogan. Successful enough to warrant repeats, the contest has become an annual affair with each contest bringing entries from approximately one-third of the employees.

### Ideas for the long range

As part of its nationally recognized suggestion award system, the then 2-yr. old company began long range promotion seeking new safety ideas from its workers. To date over 300 safety suggestions have been bought and used with such suggestions comprising about 5% of the total entries submitted to the board. The ideas put into effect through this plan range



**SUPERVISION** is charged with setting the safety example; employee cooperation is voluntary. Tool room foreman Carl Sciorba (right), talking with machinist A. J. Wilson, wears safety glasses.



**STYLE AND SAFETY** go together, as electrical worker Beverly Pickett considers popular model safety glasses offered by Barbara Yutzler, safety department.

from correction of an uneven path to an elaborate bell and light warning system which notifies machine operators when the compressed air, used on many of the machines to chuck parts, falls to 80 lb. (below which parts may fly out of the air controlled jaws). Payment for the improvements usually ranges from \$10 to \$75, with the company paying the taxes.

### Employees, supervisors pull together

While importance of employee participation was being stressed, cooperation at the supervisory level had not been overlooked. Also early in 1953, a series of development conferences including all levels of management was held, and monthly safety reports with complete accident coverage and breakdown distributed to all employees. Time-loss and cost figures for each department were given in the report and inter-departmental safety competition was encouraged.

The end of 1953 with an expanded work force of 1,300 saw AiResearch with an accident frequency rate of 10.7 lost time injuries for each million manhours worked and a total accident cost figure of \$57,031. This included direct and formalized indirect costs.

Faced with an unenviable position

in its safety division at the end of the first fully recorded year of safety effort, and with the groundwork for a safety program laid, intensification of effort seemed the only answer to the safety group. An additional series of supervisory and employee conferences brought out the fact that unsafe practices were often not recognized until after an accident focused attention on the unsound, or unthinking, basis for them. To correct this a new safety instruction booklet was prepared and distributed to every employee, the safety committee expanded, and the educational program intensified. With prevention in mind a closer study of any unusual accidents or apparent injury trends was made.

A tremendous improvement over 1953 accident figures demonstrated the value of this stepped-up campaign. With an expanded work force of 1,800 the 1954 frequency rate dropped to 4.88 and total accident costs went down by over \$21,000 to \$35,904.

### Campaign against biggest enemies

By this time the two worst safety enemies at AiResearch had been definitely identified as strain injury and eye damage, and a specific campaign against them initiated. Most of the strain accident reports tagged improper handling of some of the company's heavier units as the cause.

New lift trucks, carts, and hoists were introduced in the shop, and all concerned personnel were instructed in their proper use. The assembly line, however, with its hard-to-handle turbine and air starter units presented a different problem. Seeking an answer AiResearch turned its own engineers loose on the solution and then gave its shop the job of designing and building specialized carts. With the new cart that was developed two men could easily place the basic housings around which the units are built into a cradle mounted on four rubber wheels. The unit can then be turned a full 360 deg. in any direction and locked into any desired position. The unit remains on this cart through assembly, inspection, testing, and until it is moved to shipping ready for customer delivery. Virtual elimination of all strain injury on the line was the dramatic result and, as an extra dividend, it was found that the cart speeded production.

### 35% drop in eye injuries

AiResearch felt that eye injury, particularly exasperating from the safety outlook since use of adequate eye protection is a known answer, needed a fresh approach. In addition to



the program of free safety glasses, prescription ground when required, almost by accident AiResearch discovered how to make its employees more eye conscious when it noted that its discarded safety glasses were being salvaged by its workers for home use. It was decided to encourage this and company bulletin boards and publications were used to announce the free distribution of un-reworkable glasses. In view of the unexpectedly large demand, it was decided that reworking of safety glasses to salvage the small initial cost was a waste of time. Mindful of the number of home workshops, the danger of rotary lawnmowers, and other home hazards, and in hopes of starting eye safety at home with a carryover into work, this program was later expanded to include all glasses turned in through transfer or termination. Graphically illustrating the success of this idea is the noticeable shop increase in use of safety glasses and a rewarding 35% drop in eye injuries since inception of the program.

#### Best safety isn't good enough

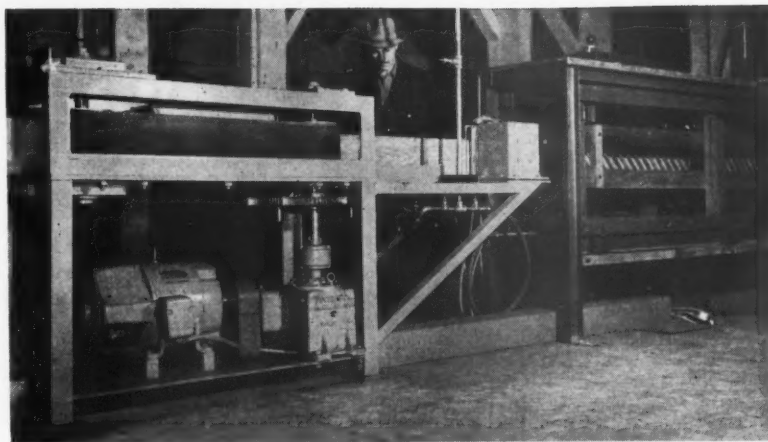
During 1955 company frequency fluctuated between a low of 2.47 and a high of 4.94 to average 3.29 for a group of employees now over the 3,000 mark. These figures were good enough to place AiResearch first among the 29 manufacturers in its regional division of the National Safety Council.

While 1956 figures are as yet incomplete, monthly safety reports to date give a 3.00-per-million-manhour reading which is lower than last year's comparable figure. No fingers are crossed by AiResearchers however, since they know that luck can't replace hard work to achieve safety.

In analyzing development of the safety program AiResearch Safety Administrator Evan Stallcup states, "We feel that the toughest part of any safety program is to keep it fresh. We try constantly to fight any trend toward complacency by actively gathering ideas from as many sources as we can and then tailoring them to fit our AiResearch problems.

#### Good reporting is essential

"A good reporting and record system," he asserts, "is the pulse of any safety program. It often lets you cure a patient before any major illness develops. Next is cooperation—you need all of it you can get from management and from every employee. We get just that here at AiResearch by keeping everybody informed, asking for and using their ideas, and explaining how we feel they can best help us to aid them."



**TO ACCOMMODATE CHANGES IN SPEED AND TORQUE** required by this glueing machine was the problem at Hammond Lumber Co., Samoa, Calif. The machine, converting odd lengths of lumber into continuous boards for cutting into standard lengths, does the job without a hitch now that . . .

## New d-c drive controls crucial drying speed

**A** VARIABLE SPEED DRIVE problem on a machine installed at Hammond Lumber Co.'s Samoa, Calif., mill has been solved by a new type d-c. motor—the first Western application of the new unit.

In their constant effort to improve lumber quality and reduce waste, Hammond engineers devised a glueing machine that binds odd lengths of boards end to end in a continuous strip from which standard lengths are cut. Thus, pieces that otherwise would be downgraded are combined to produce high grade lumber.

However, before this economy could be achieved, a means of controlling the speed of the feed rolls had to be reached so that the many thicknesses of boards available could be processed without extensive changes in the apparatus.

#### Thin, faster; thick, slower

With ends freshly glued, the boards enter the machine and are passed between feed rolls which keep the head end of each board tightly butted against the tail end of the preceding piece, assuring a good joint. Powered by the feed rollers, the boards pass through a high frequency dielectric heating section that completely cures the glue in the joints.

Thicker boards require more time for the dielectric heat curing than

thinner pieces do and the only means by which the curing time could be varied was a variable speed drive on the feed rollers. Thicker boards also require an increase in drive torque due to the increase in weight and friction and slower processing speed. However, the horsepower requirement for the machine tends to remain at a constant value.

#### The "power package"

The drive chosen to meet these requirements was General Electric's new Kinematic d-c. motor. A unit with a 2:1 speed change by field control was selected because it would provide constant horsepower over its speed range and further reduction in speed could be obtained by armature voltage control. For the new type motor on the industrial market for only a short time, this proved to be the first Western installation. The motor is built in accordance with the new NEMA standards for d-c. motors and generators. D-c. power is supplied to the unit by a "power package" that includes within its compact sheet enclosing case an a-c.-d-c. motor generator set, an exciter to provide excitation for both the generator and the motor, and the drive control system. From his station, the operator controls the drive through its entire speed range by a single dial located at his fingertips.

# Production's mighty smooth in this face-lifted plant!

When Norton Co. decided the Western market for its abrasive wheel products could be served better from a Western-homed manufacturing facility, it methodically weighed the many site-selection factors involved. Final decision led to the purchase of a 50,000-sq. ft. building in Santa Clara, Calif. Having purchased a facility not designed specifically for its operation, Norton had to modify the plant somewhat prior to occupation. Electrical distribution and lighting facilities had to be altered and up-dated and an air conditioning and dust collection system had to be installed to meet the special requirements of abrasive manufacture. Here's how it was done.

## Clean, dust-free air is one key to operating success

**M**ANUFACTURING thousands of grinding wheels per month could easily create an extreme dust problem, but a 40-ton air conditioning unit and a two-collector dust gathering system keep Norton Co.'s modern Western plant dust-free and provide temperature and humidity control important to successful mixing and pressing of resinoid bonded wheels—one phase of abrasive manufacture.

Dust in abrasive manufacturing operations occurs at many points. If

not removed from the air at its point of origin, it gets into moving parts of machinery and creates an unhealthy and objectionable atmosphere for workers. Top these factors off with the housekeeping load dust can impose and you have a sizable problem.

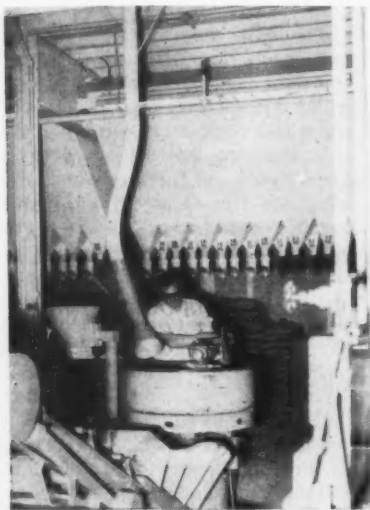
Both of the dust collectors at the Norton plant are of the reversed jet, self-cleaning type. They discharge cleaned air back into the working area, effecting a substantial saving in the heating load during cold weather.

One of the Aeroturn collectors serves an area devoted to operations that require closely controlled temperature and humidity conditions. Here, the dust collector assists the plant air conditioning system in maintaining these factors at a predetermined level, thus reducing the load im-

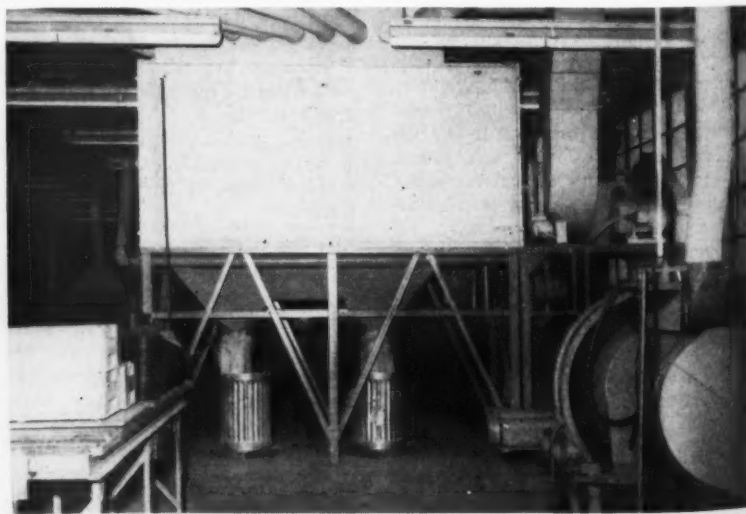
posed on the 40-ton air conditioning unit.

An unusual feature of the Norton dust collector installation is the use of separate pipes running from each machine serviced to the collector. This prevents settling of dust when individual pipes are shut off by dampers which might occur in systems involving the use of main lines and branches. It also provides flexibility. If additional equipment is added later, it will not be necessary to redesign the piping to compensate for additional capacity. The collector units were selected to provide ample capacity for foreseeable additional equipment.

Norton's air conditioning unit consists of a 40-hp. Trane compressor with Marlo cooling coils. A 10-hp. compressor will soon be added for standby.



**SEPARATE COLLECTION PIPES** running from each machine provide operating flexibility.



**COLLECTED DUST** is delivered to one of two central points by reverse jet action of the system. Collectors discharge cleaned air back into the working area, effecting a substantial saving in heating loads.

## Revamped power distribution and lighting systems

AT the time Norton Co. purchased the building to house its Western manufacturing plant, the 50,000-sq. ft. Santa Clara, Calif., structure had been vacant for several years. It was originally built to house a textile printing operation. Thus, not only were the electrical and lighting facilities outdated and inadequate, they were not originally designed to meet the power and illumination requirements of abrasive manufacture.

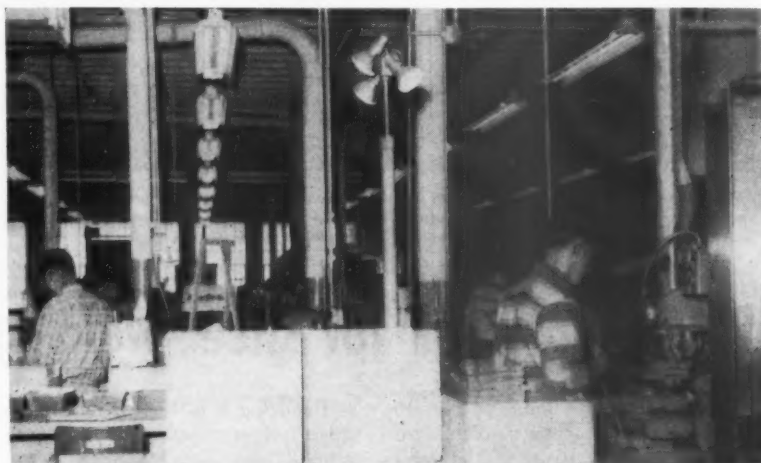
Equipment required for the manufacture of Norton's line of grinding wheels presents a relatively heavy electrical heating load, developed by kilns and tunnel ovens near the center of the 360 ft. long building. Concentrations of the motor loads for finishing operations, however, are located near the west end of the building and additional motors for forming operations are located near the east end. Existing lighting consisted of two-tube, 96-in. T-8 slim line industrial units mounted on 15-ft. centers—an inadequate system for modern factory operations.

Due to the distance separating Norton's home office in Worcester, Mass., from the new plant location, the problems imposed by the needed electrical renovation—and subsequent responsibility for the new system—were contracted to Kurze Electric, Inc., of San Jose, Calif. Engineers of this firm handled the electrical layout and construction work under the direct supervision of Norton's plant engineering department.

Initial studies to determine the most economical service location indicated savings in feeder costs by bringing the service into the center of the building. However, the physical problem of locating the necessary transformers and switchgear in this area more than



**NEW LIGHTING UNITS** were provided in the finishing area of the plant. The two-tube, 96-in. slim-line units were hung at 4½ ft. end to end on 10-ft. centers providing about 48 ft. candles of light. Fixtures in the forming area were rearranged in an end-to-end pattern on 10-ft. centers.



**SUPPLEMENTARY LIGHT** was found to be desirable at the point of contact of numerous grinding operations. Some of these situations could be handled by spot lights, but shielding hoods on the equipment made conventional machine-mounted lights necessary in most cases.

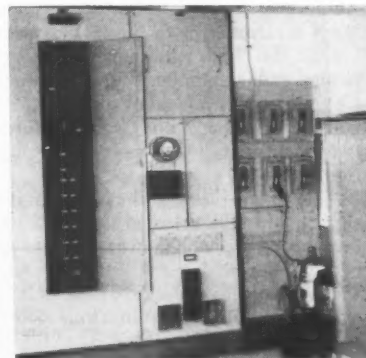
counterbalanced these theoretical savings, and the 1,600-amp., 480-v. service was finally located in the mechanical room at the east end of the building.

From this main switchboard, the distribution system was laid out utilizing the existing feeders and panel boards wherever possible and extending a heavy backbone of 600-amp. feeders into the center of the plant to carry the electrical kilns and ovens.

In the finishing area, the finishing grinders are located on both sides of a central conveyor, and all of these machines are served from a 225-amp. plug-in busduct, with fused switches running the length of the conveyor.

Existing 10-kva. lighting transformers were grouped into three 30-kva.,

... concluded on page 81



**MAIN SWITCHBOARD** and entry of the 1600-amp., 480-v. service were located in the mechanical room at one end of the building because center-entry was precluded by space problems.

### AUTHOR OF THIS ARTICLE



**PERRY J. COLLONGE**

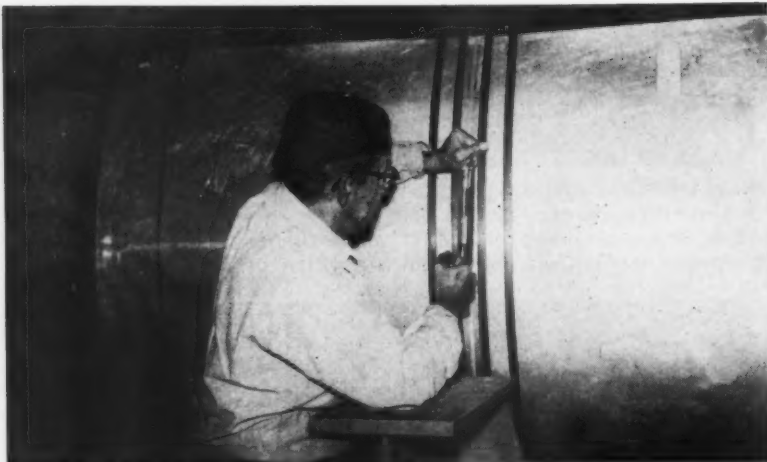
Electrical Engineer  
Kurze Electric, Inc.  
San Jose, Calif.



# POOR MAN'S AUTOMATION

at Dalmo Victor  
Company  
San Carlos, Calif.

*Second of a continuing series showing how on-their-toes Western plants are boosting production with smart but simple operating ideas.*



**SMOOTHING THE WELD** by router was a precision job; the aluminum sheet was to be used in a radar antenna and breaks in surface continuity would disturb reception. Tool that did the job was a compressed air driven router straddling the weld on small wheels.

## Revolving drum for sheet welding

**G**ET A sheet of aluminum 20 x 16 ft. welded together—aluminum does not come in 16 ft. widths—and rolled up like a jellyroll? Use the thinnest possible aluminum and eliminate all weld “bumps” so it can be used in radar microwave reception? Sounded impossible to engineers and welders at Dalmo Victor when they were confronted with the task of providing the “jellyroll” for an experimental radar antenna. But, many huddles between mechanical engineer Gordon Shepherd and welding foreman William Graves produced a solution.

They soon found that aluminum sheet could be welded as thin as .015, but the real problem was to weld it without permitting the length of the welds involved and the width of the overall piece to cause buckling. They also had to find a method of welding the sheets without warpage at the seams and of smoothing the weld joints level with the surrounding surfaces. At first it was envisioned as a flat operation, but this presented a problem of how to hold the pieces flat—how to brace the work.

Realizing it just could not be done against the ceiling, they designed a giant drum to handle the job. Accordingly, a drum more than 16 ft. long and 7 ft. in diameter was fabricated for the job by Consolidated Western Steel in South San Francisco. It was set up on steel stands to clear the floor at Dalmo Victor.

At one end of the drum a variable speed gearmotor was stationed. It drove the drum through a Whitney chain which rimmed a circular piece of 1¼-in. steel. Short steel dowels set in the rim of the steel plate about every 9 in. acted as sprocket teeth for the chain drive. The drum was also scribed with a 25/1000-in. wide and 3/16-in. deep groove encircling it at one end.

Two sheets of .020 aluminum 20 ft. long and 3 ft. wide were then drawn onto the drum. The joint between these two sheets was made to coincide with the 3/16-in. groove in the drum. “Belly bands” were cinched around each sheet of aluminum and the sheets were ready for welding.

Another stand was built to hold a welder high enough to give him easy

access to his work. With the drum turning at a slow but even rate, an aluminum weld was laid into the joint by heli-arc process the length of one revolution of the drum. This required about 75 min.

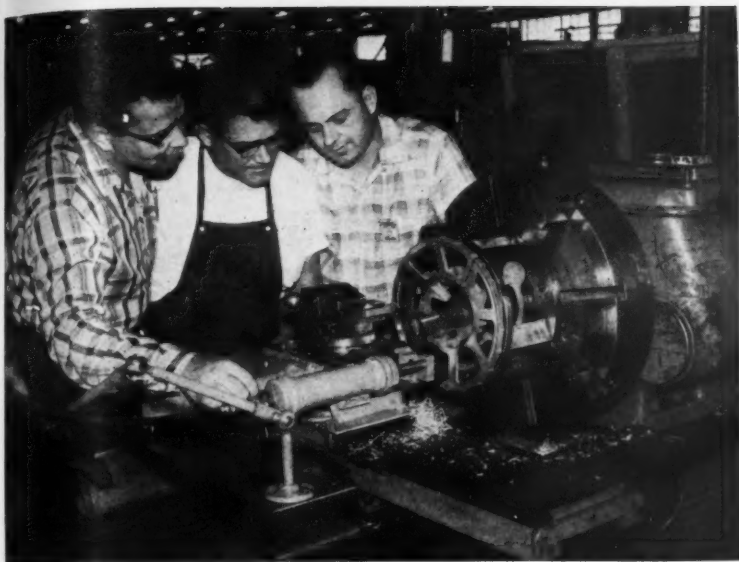
To prevent pulling at the cooling weld, another man stood at the rotating drum peening the weld to give it the proper expansion factor. A special tool was devised to smooth the weld ridge. Riding on small wheels, a compressed air driven router ran along the surface of the sheets while straddling the weld. The bite of the router could be set at an exact level to remove the weld ridge. When one side had been thoroughly smoothed, the sheets—now effectively joined—were peeled from the drum, turned over, and smoothed on the under-side of the weld seam.

The first two welded sheets were then moved down the drum and a third sheet wound on to butt with the joint edge exactly over the 3/16-in. groove in the drum and the welding operation repeated. Three more sheets were added in this manner and finally the required sheet of aluminum, smoothly and effectively welded, was removed ready to be used in the assembly of the experimental antenna.

## Air cylinder speeds up lathe operation

**O**NE OF Dalmo Victor's major machining operations—parabolic contour turning of reflector brackets—has recently been streamlined and made more accurate as a result of another employee-generated suggestion. Turning the brackets on a lathe was previously performed by a counterweight, rope and pulley attachment. Working in conjunction with a fixed follower and cam, this actuated a longitudinal movement of the lathe carriage when the cutting tool was fed automatically across the work.





**AIR PRESSURE** replaced a carriage actuator consisting of a counterweight, rope, and pulley attachment. Now, the cylinder forces the lathe compound forward and brings the fixed follower against the cam face, giving the operator constant control of cutting tool.

Although that mechanism served its purpose, it was bulky and difficult to handle. Al Scherer, machine operator leadman in the department and foreman Jack Bilok ganged up on the unwieldy situation and came up with the idea of swiveling the lathe compound parallel with the machine ways and mounting an air cylinder on the base of the compound.

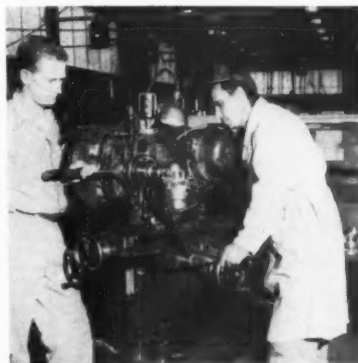
Once installed and operating, the air cylinder provided pressure to force

the compound forward toward the work surface and, at the same time, bring the fixed follower—now assembled to the compound—against the cam face. This new set-up eliminates the necessity of moving the lathe carriage except to position it correctly in the initial set up. No longer is the operator concerned with the carriage movement. Instead, he has immediate and constant control of the cutting tool mounted on the compound.

## Milling time cut by 86% with new operating linkage

**A** MILLING job formerly requiring 35 min. of work has been stepped up in efficiency until Dalmo Victor milling machine operators only spend 5 min. on it. The piece being milled is a rotary choke on a "switch" which enables the mounting of two sets of tubes known as "wave guides" on one end of a rotary joint. This type mounting permits radar antenna to scan at twice the rate possible with single "wave guide" units.

The rotary choke requires milling of one portion to .011 in. below the remaining surface. A Bridgeport milling machine was previously used for the job and was equipped with a dividing head which had to be passed across the entire surface of the piece



**MILLING TIME WAS REDUCED** from 35 min. to 5 min. by a Hardinge spur spacer linked to a Nichols handmill by linkage levers working from the machine cross slide.

at least a dozen times to achieve the necessary cut.

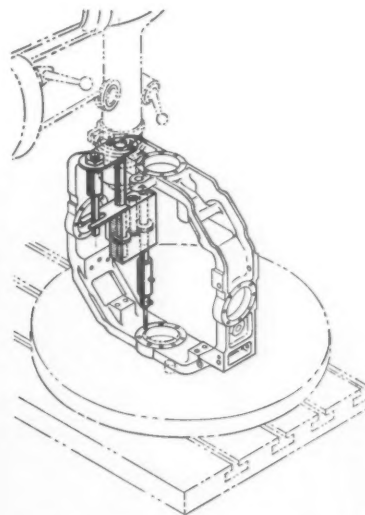
Section foreman William Rixon pioneered an improvement calling for attachment of a Hardinge spur spacer on a Nichols handmill by means of linkage levers which work from the

cross slide of the machine. When the lever is moved, an end milling cutter passes across the surface of the piece just once producing the necessary .011-in. cut in the radial surface. This method of milling the piece not only reduced the time required, but improved the quality of the finished surface greatly.

## Offset attachment boosts tapping efficiency 500%

**E**FFICIENCY has been increased by 500% at Dalmo Victor Co. in tapping holes on the inside of gimbal frames for an antenna used on radar equipment manufactured by this San Carlos, Calif., plant. Access to the holes is through a 10-in. opening in the gimbal frame which made the use of machine tapping equipment impractical. The holes had to be tapped by hand.

Finding the hand-tapping operation tedious, tool room machinist Eugene Burkhard put his imagination to

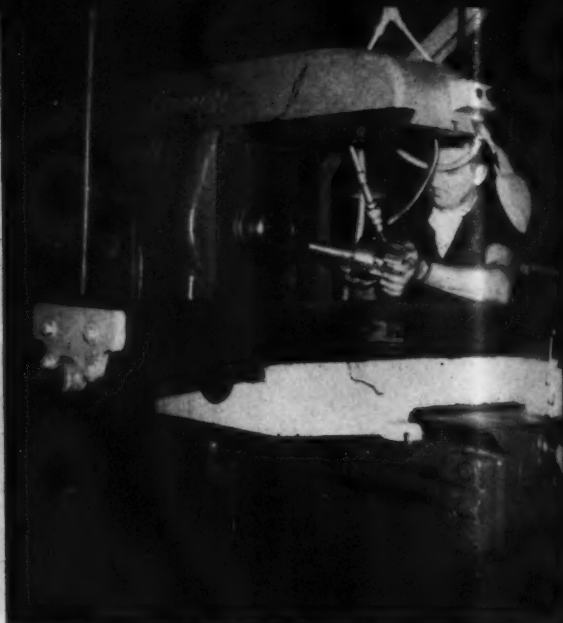


**SPECIAL MILLING ATTACHMENT** was devised to tap holes within a 10-in. cylinder. By linking the tapping machine's action to an offset tap, hand tapping was eliminated.

work at home and developed an offset attachment which hooks onto the tapping machine and automatically threads the gimbal frame holes. The attachment consists of a steel body, two shafts, and a set of gears to provide the mechanical power transmission from the tapping machine to the tap inside the frame.



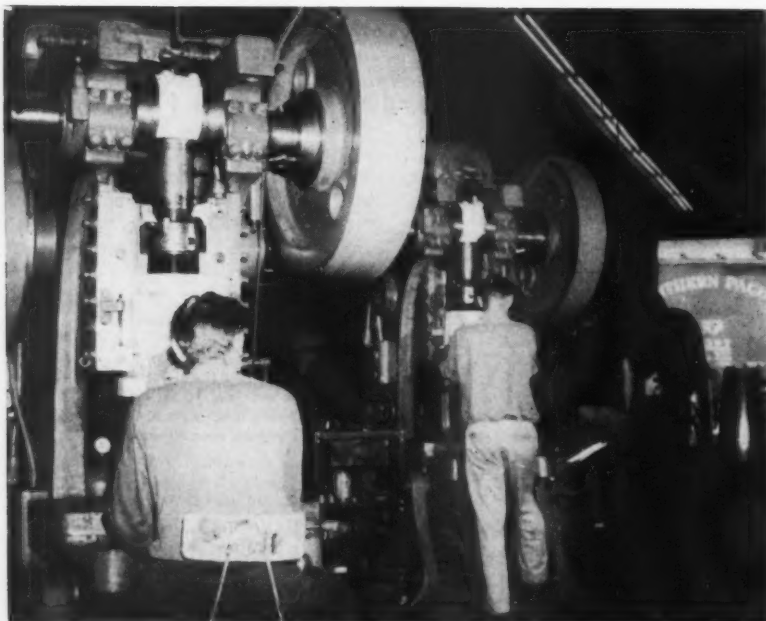
**LUBE SYSTEM** for such machines as this Hydro Press underwent thorough study at Pastushin because plant operators were not satisfied with "Fair" maintenance.



**LUBE FREQUENCY** was cut down, as was the number of different products used. For example, both factors were reduced by 50% on this Maximillier.

## 'Excellent' maintenance pays off

*Here's how Pastushin Aircraft in Los Angeles jumped its government machine maintenance rating from "Fair" to top grade.*



**PARTS REPLACEMENT** and cleaning, a task that was previously a cause of much downtime on the line of presses at Pastushin, has been reduced to a minimum as a result of changes in upkeep practices.

**P**LANTS WORKING on government contract often jest at the "pain in the neck" given them by official inspectors of plant facilities. However, the inspection and subsequent rating of maintenance effectiveness of government-leased production equipment provides a yardstick as to quality of maintenance that is otherwise difficult to obtain. Poor maintenance can eat up plant operating funds quickly and "almost excellent" maintenance will eat up a proportionate share.

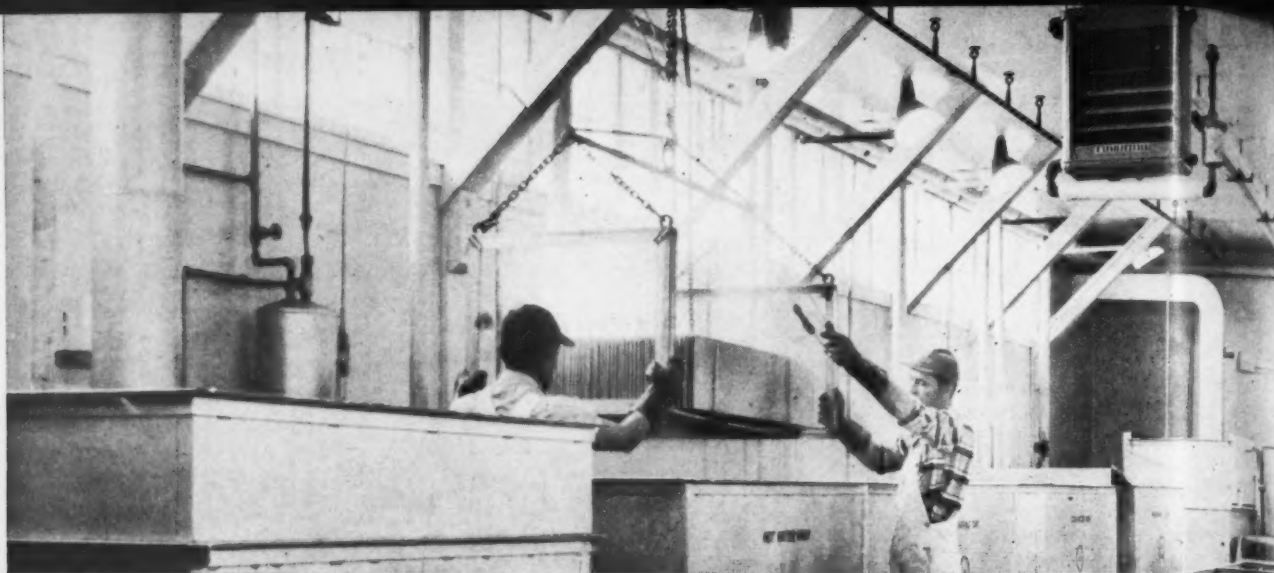
### Maintenance rating goes up

Pastushin Aviation Corp., Los Angeles, realized the benefits of such inspection when, upon a January 1956 inspection, the Air Force issued the following statement: "A remarkable improvement has been effected in the care and maintenance of government leased equipment located in this facility. Rating: Excellent." A year and a half prior to that, Pastushin's maintenance rating was "Fair."

The difference between fair and ex-







**NO WASTE MOTION HERE**, with electric-hoist equipped monorail spanning entire processing line to handle aluminum sheets from vapor degreaser (right background) to dryer in foreground. Load is shown here coming out of boiling water bath. It's a good example of many built-in smart operating ideas, that show you how . . .

## Anti-waste-motion production

*. . . is the key to manufacturing economies at Southern Pacific's new aluminum sign shop. There are a dozen good ideas here for you.*

**W**ANT A DOZEN good production ideas, particularly those that save waste motion? Then take a trip with us here through the new sign shop set up last November by the Southern Pacific Co. at its West Oakland yard. A new type of reflectorized metal railroad sign has gone into mass production there in the 38 x 80-ft. shop under the supervision of W. R. Jones, superintendent of SP's mill of which the sign shop is a part.

Chief product at the shop right now is the new aluminum sign, which is rapidly replacing old-style wood and steel signs along the line's right-of-way (because they afford sharp visibility of warnings at night or in storm and fog conditions, they outlast other signs two to three times, and require virtually no maintenance).

### The production scheme

The shop's manufacturing process, planned to eliminate waste motion, is separated into two primary steps: (1) preparation of aluminum sheets and (2) actual production of the signs.

Aluminum sheets are purchased in various gages, and in sizes pre-sheared to specifications. First step is to have

SP's blacksmith shop punch mounting holes in the sheets, using special jigs, thus insuring conformity between lots. A fork lift truck brings the palletized sheets to the sign shop, where a pneumatic rubbing machine first removes lacquer ink print from the face of the sheets. A rack on a casted dolly receives 51 large or 102 small sign blades. Made of stainless steel, the racks are designed to hold sheets spaced in a positive vertical position.

Loaded racks are rolled under a monorail which spans the processing line and lifted by electric hoist into a degreasing tank. Sheets are immersed in a vapor for 10-15 min. An exhaust blower removes fumes. The Blakeslee degreaser also has an automatic water flow valve on the condenser and an automatic remote-controlled temperature valve on the steam line, which functions in case of a condenser failure.

Step two in the lineup is immersion in a 400-gal. capacity etch bath of 8% phosphoric acid solution, for a period depending on the temperature of the bath. Good production scheme here was to make an etch bath heater and temperature controls unnecessary by placing the bath near the degreaser.

Racked sheets come out of the degreaser hot and dry. The acid solution is preheated at the start of a shift to about 95-deg. F. by steam injection. After the initial heat it increases in temperature through use to some 120 deg.

Upon completion of the etch, which gives the aluminum surface a "bite," the load is switched to a cold water bath. Fast immersion stops the etching and releases surface acid on the plates, which in turn frees the aluminum particles held in suspension from the etching. A flow of clear water through a skimming trough at the top removes waste particles, doing away with tank sedimentation. A 3-min. wash is sufficient to clean the load.

### Double-purpose hot air dryer

Hoisted along the monorail again, the load is dropped into boiling water for 2 to 3 min. This removes all traces of acids or alkalies and brings the sheets to a high temperature for final drying.

A specially-built hot air dryer is the last stop on the etching line. This consists of a heater unit prefabricated



from finned radiator pipe and steam heated. It has a built-in blower that draws filtered dry air from a space between roof and ceiling and exhausts it through the heating fins before passing upward through the aluminum sheets. At 180 deg., a load dries in less than 90 sec.

The dryer is a dual-purpose unit, in that the blower delivers 50% more air into the shop than the exhaust blower on the degreaser is taking out. Thus the shop remains free of dust which normally would be drawn in around door openings. In dry weather, when aluminum is not being processed and the degreaser is shut down, the heat on the dryer unit is cut off and only the blower remains in operation. This raises the inside pressure and prevents cement dust from entering the shop from the adjacent concrete yard.

From the dryer, the load is detached from the monorail and trucked by dolly to horizontal storage racks. Aluminum sheets are handled only with washable cotton gloves to prevent skin oils from affecting the etched surfaces.

#### Uniformity out of variety

The second major phase of the sign-making operation is the application of backgrounds and legends. These are in a variety of colors, depending on the nature of the sign. Reflective backgrounds are Scotchlite, and non-reflective legends are Scotchcal. Both come in 50-yd. rolls, stocked in a specially-made storage cabinet.

Letters and numerals are made up in stock lots, cut from the 24-in. wide Scotchcal material. Here is an example of the procedure:

A composite of all the necessary letters is arranged on the 24-in. width, giving a finished dimension of 14 x 24 in., by juggling the letters around. The composite is duplicated on a silk screen stencil, which becomes the permanent pattern. From this stencil prints are run on sheets of Masonite, 14 x 24 in., for the actual cutting pattern. Then as many 14 x 24-in. sheets of Scotchcal as desired are cut and stacked in piles of 100 each with a Masonite template on top. Each letter is then cut out by scroll and jig saw. Superintendent Jones says the SP achieves a considerable saving by this procedure.

When an operator is ready to produce a sign, he selects the desired color and width of background material and places the roll on a spindle at one end of the 3 x 10-ft. cutting table. Setting the required length with a gage bar, he feeds the roll through a spring-loaded shear which is operated by a foot-

controlled air cylinder. An electronic counter keeps a record of the number of lengths cut. The shear blade is shielded by a Plexiglas guard.

Another SP sign shop innovation is to use a small motor-driven abrasive wheel to loosen the backing of cut sheets of Scotchlite, rather than picking at it with a thumbnail.

Actual sign fabrication now begins on the makeup table. The correct size of aluminum sheet is aligned against jib stops. The same stops are used to align the stripped reflective background on the aluminum, tacking it with a hot iron or liquid activator. Another of the interchangeable jigs is swung into place and used as a guide to tack down the legend.

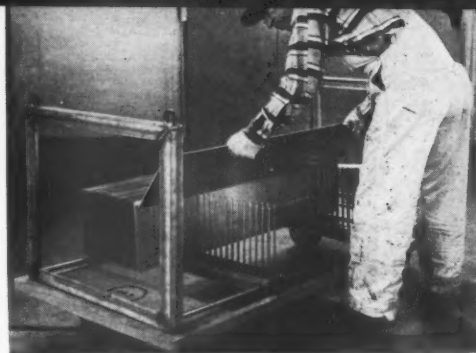
Now, from four to six 4 x 6-ft. Masonite sheets are covered with the signs on loading tables. These are topless racks of angle iron on casters. As the loading boards are filled by one workman, another moves up a table with loading board in place.

Rolled to the opposite end of the shop, loading boards and their contents are placed two at a time in a vacuum applicator, made by Minnesota Mining & Manufacturing Co. The vacuum cover is closed and a full vacuum of 25-27 in. is applied in approximately 60 sec. After another inspection of sign faces and legends, the heat chamber cover is lowered and locked and steam heat at 188 deg. is applied, the time varying with the gage of aluminum. Pressure is in the range of 1 ton per sq. ft. At the expiration of the bonding process, boards and contents are placed in an adjacent cooling rack which permits free air circulation. Work proceeds continuously during bonding cycles, with operators assembling signs at the makeup table.

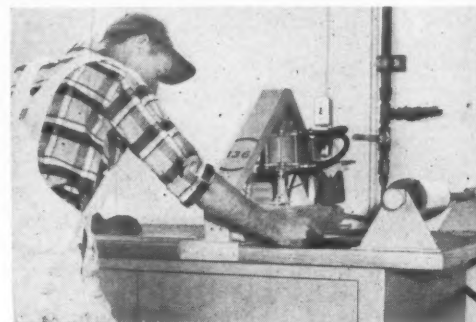
#### Packaging techniques

From the cooling rack, boards go directly into custom-made corrugated paper cartons. This operation is done on a large casted table, near the cooling rack and knocked-down carton storage section.

Signs go face up in an open carton. At this stage the operator removes a protective paper covering which has been over the legend throughout the fabrication. The sheet of backing paper which was originally removed from the Scotchlite now goes over the face of the sign. Into the package goes all the necessary hardware, including shims for signs that will be adapted to existing posts, and full instructions to insure correct mounting. Cartons are sealed with gummed tape supplied by electric dispenser which delivers right length by dialing.



**SPECIAL RACKS** carry sized and punched aluminum sheets on fast journey through the etching line.



**FOOT-OPERATED SHEAR** has plastic guards and electronic counting device to record lengths cut.



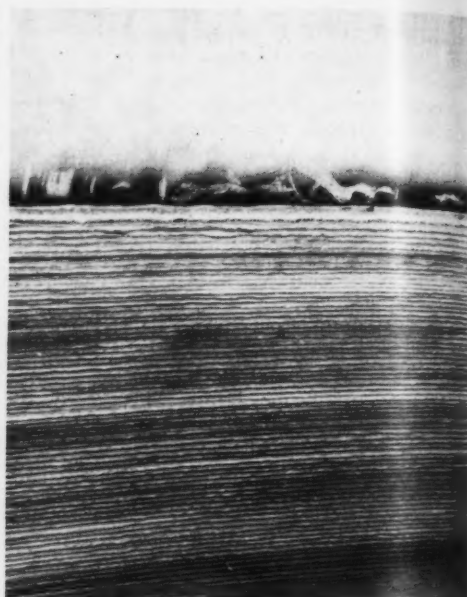
**METAL JIG** is flipped over aluminum sheet positioned in wooden jig, for lettering alignment.

**LOADING BOARDS** with signs get set for heat-pressure bonding.





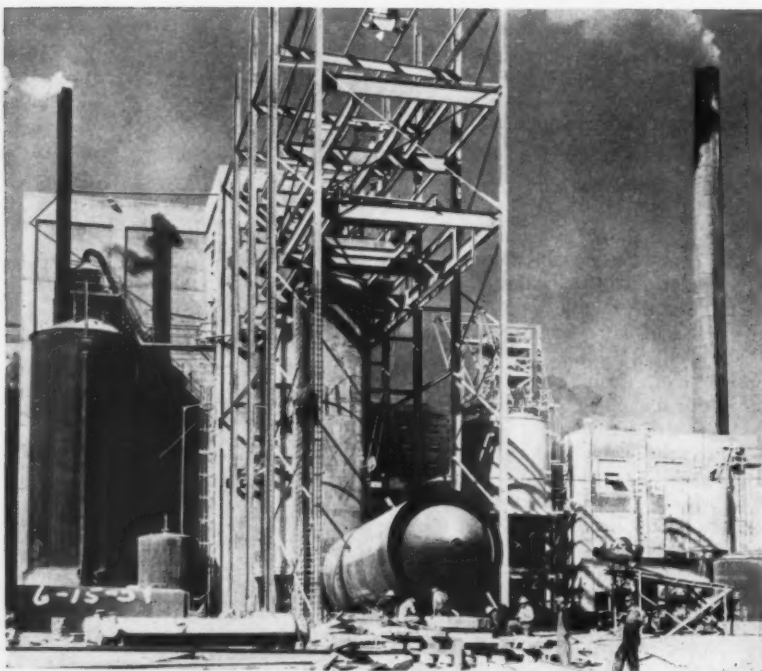
**THREE SEMI-AUTOMATIC WELDING UNITS** operated in each of the 40-ft. high pulp digesters at the Longview, Wash., pulp plant. In certain areas, the walls required as much as a 1-in. . . .



**BUILD-UP OF STAINLESS STEEL**, shown above with lower section clad with 3/16-in. beads and the upper section not yet surfaced.

## 40-ft. tanks relined by welding

Here's how a semi-automatic welding process made stainless steel relining of Weyerhaeuser's big pulp digesters economically possible.



**WHEN INITIALLY INSTALLED**, wall thickness of the digesters was 1 5/8 in. Sloughing action reduced this to an unsafe 5/8 in. on certain wall areas.

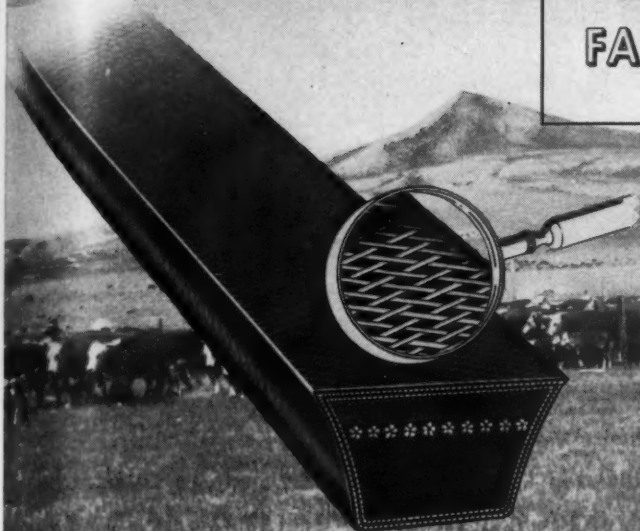
**FIVE** 40 ft. high digesters which have been used and worn at Weyerhaeuser Timber Co.'s Longview, Wash., pulp division plant were recently restored to service with the aid of automatic welding equipment at a savings of about \$250,000 over the cost of new digesters. Stainless wire overlay of the digester shells, which had been reduced to an unserviceable minimum by sloughing and abrasive action of pulp processed, was only determined to be economical with the advent of gas shielded welding equipment.

### Nature of sloughing unknown

The digesters are each 11 ft. 2 in. in diameter and, when initially installed, had a wall thickness of 1 5/8 in. During their seven-year use, the shell thickness was reduced to 5/8 in. in certain sections. Known causes of this reduction are chemical attack from the cooking liquors, sodium hydroxide and sodium sulfide, and the abrasive action of the pulp mass. Other matters such as electrolysis and cavitation could also be listed as possible

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LOS ANGELES, CAL. SO. SAN FRANCISCO, CAL.

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causes, but the exact nature of the sloughing action is not entirely understood in the pulp industry.

### Old overlay methods impractical

Wood chips are cooked in the digesters at a pressure of 104 lb. per in. gage and a temperature of 340 deg. F. These operating conditions make the digesters unsafe for use when shell thickness has been reduced to less than  $\frac{5}{8}$  in. It had been found that overlaying the shells with type 310 stainless steel—using stick electrodes—completely stopped the sloughing. However, this is an exhausting method for welding personnel and it made complete overlay impractical until development of the gas shielded welding processes.

Using Air Reduction's Aircomatic process, Weyerhaeuser was able to horizontally overlay the digester shells in a vertical position. Three model 21 guns with CAV welding machines and allied equipment were used. All three guns were operated in the digester at the same time. Each operator worked a  $\frac{1}{3}$  section of the vessel with an overlap at each end of the operator's zone.

### New equipment used

The entire operation was semi-automatic. Travel equipment consisted of No. 10 radiographs with special indexing racks and Aircomatic guns with racking assemblies. Indexing racks were cut with a four thread-per-in. lead so that  $\frac{3}{4}$  turn of the wheel raised the gun  $\frac{3}{16}$  in. Accurate indexing was important to get a uniform overlay and the setting had to be the same for each pass.

Radiograph's were equipped with side roller attachments which served as a guide to hold the equipment to the contour of the digester shell. Shell contour was not uniform so the in-and-out racking on the guns was necessary to maintain a reasonable nozzle-to-work distance and gas pattern. Fresh air was introduced into the digesters while welders were working through an 8-in. outlet at the bottom of the digesters.

### 6,000 lb. of wire per digester

Each of the digester's 1,330 sq. ft. required 4.5 lb. of 1/16-in. type 310 stainless steel welding wire—a total of 6,000 lb. per digester. Approximately 43,000 cu. ft. of Airco No. 2 shielding gas was used during the overlay of each shell. Total time consumed for all five digesters was 8 mo.





## Ask the man with the gun

The chances are you know him. You can find him in every plant and factory, every lumbering camp or construction site in America. And when he *points* that gun, wheels turn, gears mesh—things happen! All of industry moves on the grease-barrage he lays down.

Previously, it took a lot of different greases to do all the jobs the gunman had to do. Sometimes a single plant would stock as many as forty or fifty types! But now *one* multipurpose grease meets all these needs. That grease is Richfield Rocolube.

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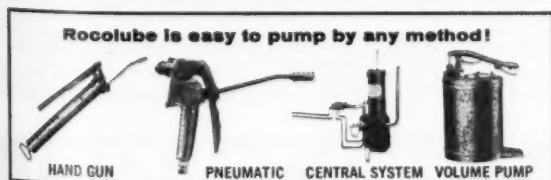
Richfield Rocolube can be used to lubricate everything from a small electric motor to a locomotive...including

ing conveyors, water pumps and airplanes... trucks, track rolls and construction equipment! You *need* no other grease. This means that you save money so many ways: fewer, larger purchases are possible...inventory can be reduced...and the chance for lubrication error is virtually eliminated.

In addition to being versatile — and competitively priced — Richfield Rocolube has other fine qualities. It works as well in arctic cold as in desert heat. It's water-proof, tough and also easy to pump.

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Call the Richfield office nearest you today. Let the lubrication expert there show you what grease gunmen have *proved* about new Richfield ROCOLUBE. Call now!



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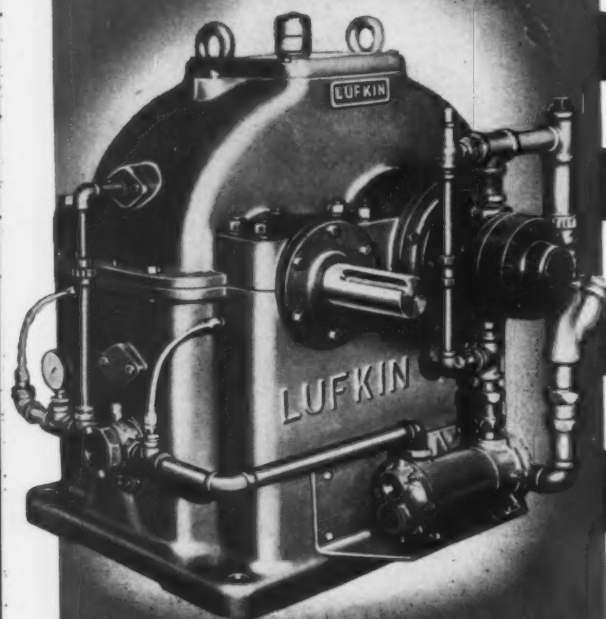
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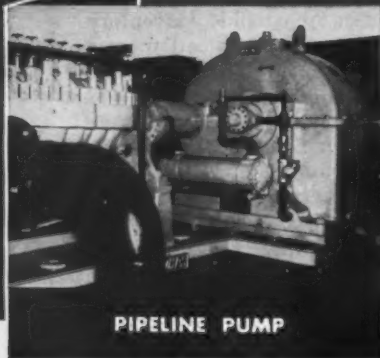
**ANY RATIO**

**1 TO 1 TO 70 TO 1**

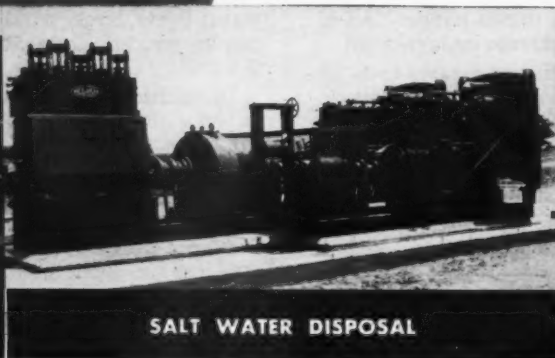
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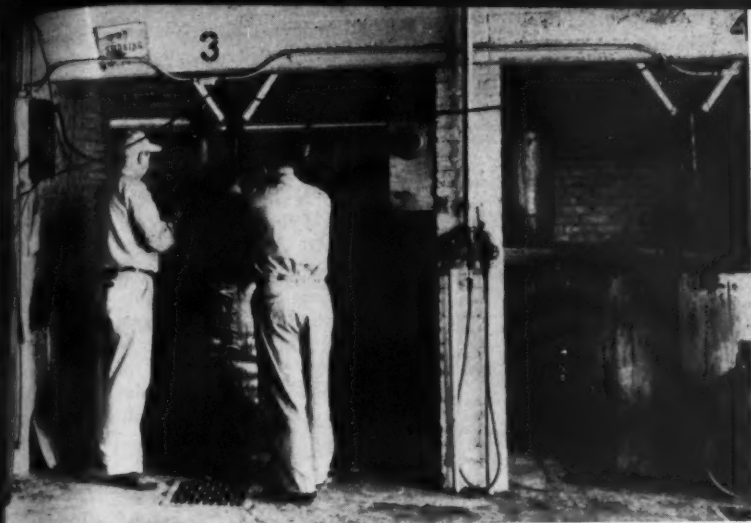
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WESTERN INDUSTRY — August 1956



**NO FUMES**, (above) even though workmen are adding solids. To conserve space, vapor incinerator is installed beyond No. 3 parapet wall and fan behind No. 4 parapet wall. Enclosed panel board for electronic type of combustion safeguard is at right of operator.

**SAFETY FEATURES** (howler and temperature limit) are pointed out at left by Clarence Nelson of Dunn Edwards Corp. while John Hirt, president of Hirt Combustion Engineers, looks on. Dunn Edwards installed the unit to replace a water wash system after neighbors complained of fumes.

#### A CASE HISTORY

## How one industry got smog out of its 'air

**I**NDUSTRY usually gets most of the blame for bringing on the smog in the Southern California basin, so it's no wonder that plants in the basin are making great efforts and spending plenty of dollars to avoid the stigma of being branded as smog "violators."

One of the most frequently-cited industries in the area's smog battle has been the varnish industry. When varnish is cooked, many of the basic constituents break into lower hydrocarbon molecules that cause irritation to eyes and nose. By water-washing fumes, 90% of the irritants can be removed—but the remaining 10% get into the atmosphere to create a nuisance.

To eliminate this nuisance and to allow the varnish industry to meet the requirements of the Air Pollution Control District (which has ruled that all fumes of a combustible nature must be eliminated from the atmosphere), a unique vapor disposal unit especially constructed for disposing of varnish vapors was developed. Many varnish plants in the area have already installed the unit in their plants, and other industries—paint plants and lithographers, for example—have also put it to good use.

Hirt Combustion Engineers, a Los Angeles engineering firm, designed the unit not only to be efficient in disposing of varnish vapors but also for oper-

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V. J. Fawcett

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Lufkin Foundry and Machine Company is the home of "Lufkin Gears for Industry" . . . built to meet the specifications of Industry's most discriminating engineers and to endure under the most severe types of service which can be imposed?

Coon hunters consider Lufkin a "Piney Woods Paradise" and they say that some of the greatest coon hunting in the world is within 15 minutes of the city limits?

Lufkin Foundry and Machine Company has nothing to do with the restaurant business, but maintains a little hunting club out at Piney Ridge where the cook and his helpers dish out some of the finest Southern Cooking you ever shook a corn pone at . . . m-m-m . . . fried catfish, black eyed peas and turnip greens . . . You all come!

Lufkin Foundry and Machine Company maintains factory sales and service offices throughout the U.S. and serves Canadian oil fields through its subsidiary, Lufkin Machine Company, Ltd. at Edmonton.

*V. J. Fawcett*

Write for new G-4 Gear Bulletin

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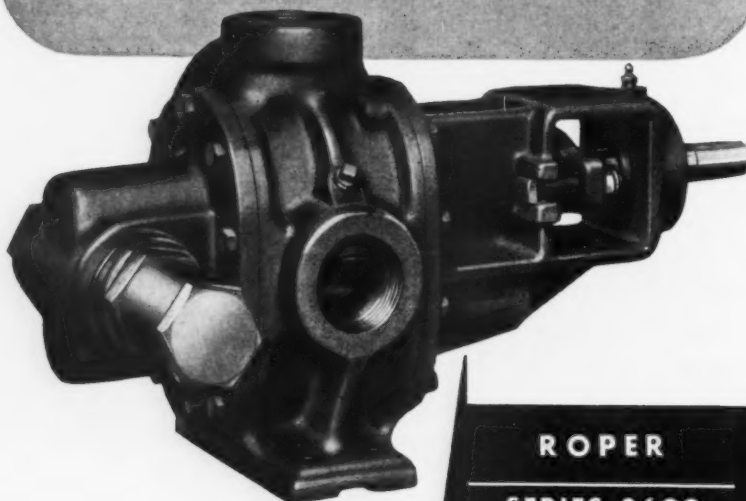
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ation with a minimum of capital because, although smog control is considered a necessity, it also requires non-productive capital. Here's how the unit works:

Prior methods of disposing of varnish vapors consisted of a blower sucking off the fumes and pushing them through an incinerator. Although this system is generally satisfactory, Hirt engineers decided that the cost of blower maintenance due to vapor condensation was excessive. Another goal was to eliminate the nuisance of cleaning the blower.

### How the system works

The Hirt unit instead uses a system that sucks fumes through a disposal incinerator and then uses the blower to dispose of the remains after incineration. The unit has five basic components. In addition to the blower, motor, and exhaust stack, the unit utilizes a special hood collection system and a specially-designed incinerator.

The hood collection system takes up all fumes without taking in an excess of air so that fumes become diluted without becoming too air saturated to be incinerated. The incinerator is designed to incinerate all products with minimum combustion volume. To assume a minimum amount of excess fuel, the unit has an automatic throttling control.

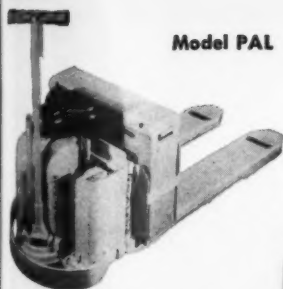
The blower has a high temperature alloy impeller that resists the heat. For economy, the remainder of the blower is not insulated. Insulation is not needed because the blower gases are completely incinerated. This permits an inexpensive design compared to blowers in conventional systems.

For safety, special controls have been incorporated into the unit. The damper is designed so that it will open or close completely, with no possibility of being half open. This eliminates flashback that occurs when fumes travel too slowly from the hood through the ducts to the incinerator. Other safety controls shut off the main burner if the fire goes out, temperature becomes excessive or the blower stops, and warns the operator immediately if the incinerator is not working normally.

The operating economies have been satisfactory. The system has been balanced so that at maximum vapor production the main burner is automatically throttled down to almost a pilot burner. Therefore only during the early heat up stages is full fuel input required. In plant installations to date fuel costs have not increased to any major extent.



Model PAL

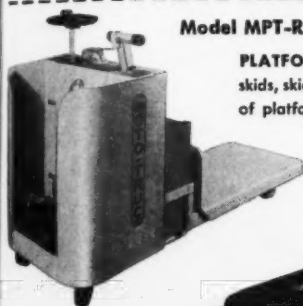


**PALLET TYPE**—For horizontal movement of loads on pallets. Both standard and extra short models available.

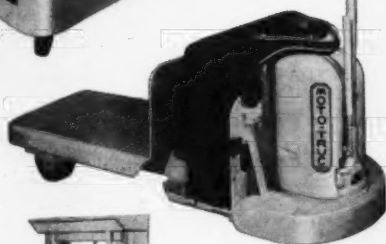
Model PAL-R

Model MPT-R

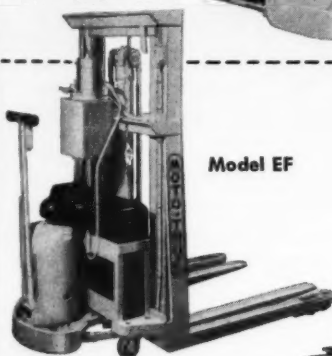
**PLATFORM TYPE**—For transport of skids, skid boxes, bins, etc. A variety of platform sizes are available.



Model MPT

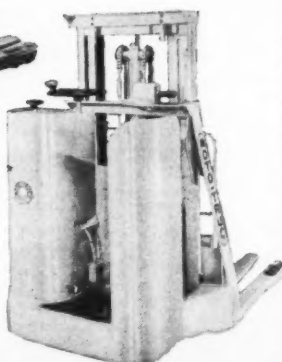


Model EF

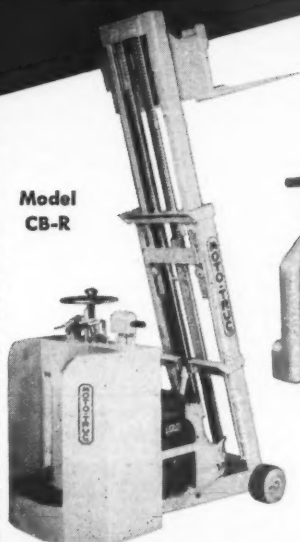


**OUTRIGGER TYPE**—For high tiering loads on pallets. High platform trucks for stacking skids are also available.

Model EF-R



Model CB-R



Model CB



**COUNTERBALANCED TYPE**—For high stacking operations. Built with tilt and with or without telescoping uprights.

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**SCRUBBING FLOORS** properly and often can mean fewer accidents and a saving in production dollars.



**MECHANIZED EQUIPMENT** for floor maintenance not only cuts time, but efficiency goes up too.

## Keep it clean and save \$\$\$\$

*Sharpen up your floor maintenance, and you'll cut accidents and production losses. Here's an expert's views on how to do it.*

**S**LIPS and falls on plant working surfaces took the lives of nine men and injured 2,319 others during the month of December 1955 in California's industrial plants. About 30%—exactly 674 workers—of these injuries occurred on floors, ramps, runways, and platforms. Only two were fatal, but lost time and production cost a staggering sum, not to mention the suffering and inconvenience experienced by the injured workers.

When it is realized that these figures (taken from "California Work Injuries" published by the Department of Industrial Relations, State of California) cover only one month for one state, the vast import and extent of the problem of keeping floors and other surfaces dust and litter-free becomes starkly evident.

### Beat the dust dangers

The mundane task of floor maintenance is frequently over-shadowed by the larger and more romantic mechanical and other building-maintenance operations. Millions are spent annually on plant and mechanical maintenance, and rightfully so. However, the National Sanitary Supply Assoc. reports that last year \$19,000,-

000,000 was spent for labor and \$1,000,000,000 for sanitary maintenance materials, a not inconsiderable sum.

We all recognize the threat inherent in dust as one of the worst destroyers of machines, equipment, and inventory as well as the role of dust in the occupational hazards of breathing contaminants continuously. Yet less attention is given to the most important source of dust and unsafe conditions—horizontal surface and floors—than to anything else.

Until they become a considerable problem, very few people stop to think about floors. It can be readily seen, however, that the floor of any structure is the very heart of the structure.

### AUTHOR OF THIS ARTICLE



**WILLIAM H. WHITE**

Owner  
Wilwite Associates  
Oakland, Calif.

The walls and ceilings and roof are only provided for one purpose—to protect the floor. Everything we do is done on the floor. We sit, work, fabricate, store, keep records, and plan on the floor. Without a floor there is no usable building.

### How to treat cement floors

One of the most popular plant floor construction materials is cement or concrete. Because it is relatively strong and economical, there is more square footage of concrete than any other type of floor material in use. However, it is subject to a few weaknesses that can be corrected or minimized with proper care.

Perhaps due to the economy of these floors, it seems that they are more neglected than any other type. We have all seen worn, rutted, uneven, dusty, unprotected, unsightly cement floors which can contribute immeasurably to advanced wear of machinery and increased cost of mechanical maintenance.

Modern high speed materials handling equipment, such as forklifts, with their highly concentrated loads, give floors more wear and abuse than they ever had before. Uneven, rutted, or worn floors frequently contribute to

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Typical San Francisco scene when Marwedel became  
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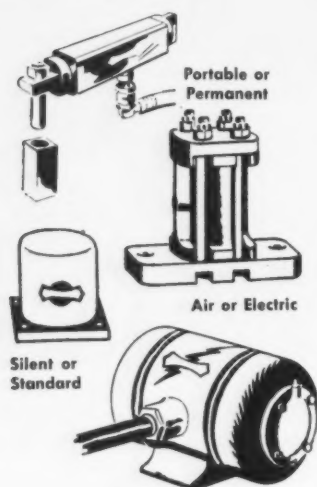
## ELIMINATE PROCESSING DELAYS



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saves many man hours by speed-  
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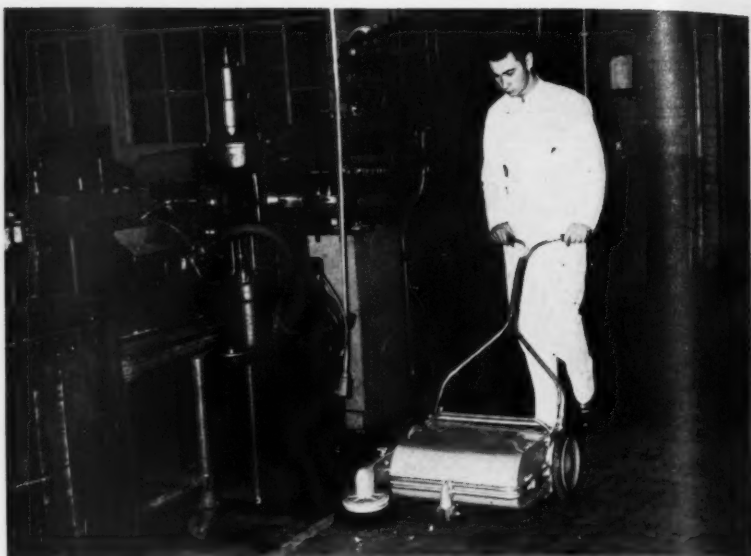
Food processors are finding that  
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in our new, completely silent  
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for a catalog and price list.



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**MECHANICAL SWEEPERS**, by eliminating soil and litter, are a production aid in many ways. For example, keeping floors free of waste materials and dirt provides better traction and tire savings for lift and hand trucks.

the "dumping" of loads and result in lost merchandise, lost time and production, and possible injury to the operators.

Modern chemistry has devised sealing products that are simple, easy, and economical to use. These materials will fill the pores, bind the cells of the concrete together, and seal the surface so that there is little, if any, dust and so that wear is kept to a minimum.

Most concrete floors "dust" or "bloom" through the natural action of the lime content of the floor uniting with moisture either in the air or from outside sources. This "dusting" is in reality the slow disintegration of the concrete and can be controlled greatly or eliminated entirely by the use of cement seals, finishes, paints, or hardeners.

Many fine products for these purposes are available but have not been as popular as they should be due to the fact that most are surface finishes. Any surface finish will wear off leaving unsightly traffic lanes. Because traffic lanes are hard to reblend into the general appearance of the floor, chemical manufacturers are turning to the use of penetrating seals. These products have been highly recommended in the past and did a good job as far as possible, but they were subject to destruction by the natural efflorescence of the lime salts contained in the floor.

They were also difficult to apply, requiring a completely dry surface that had first been thoroughly cleaned and then "etched" with muriatic acid and water or sodium bisulphate alone or

combined with scouring powders and water. The floor then required rinsing and naturalizing to control excess acidity or alkalinity.

More recently developed floor sealers contain chlorinated rubber and are good, but the chlorinated rubber materials do not lend themselves to penetration of the surface to any great degree and have a tendency to wear. No product will withstand the abuse that a floor takes. Even thick steel plates wear in time.

### Today it's vinyl plastics

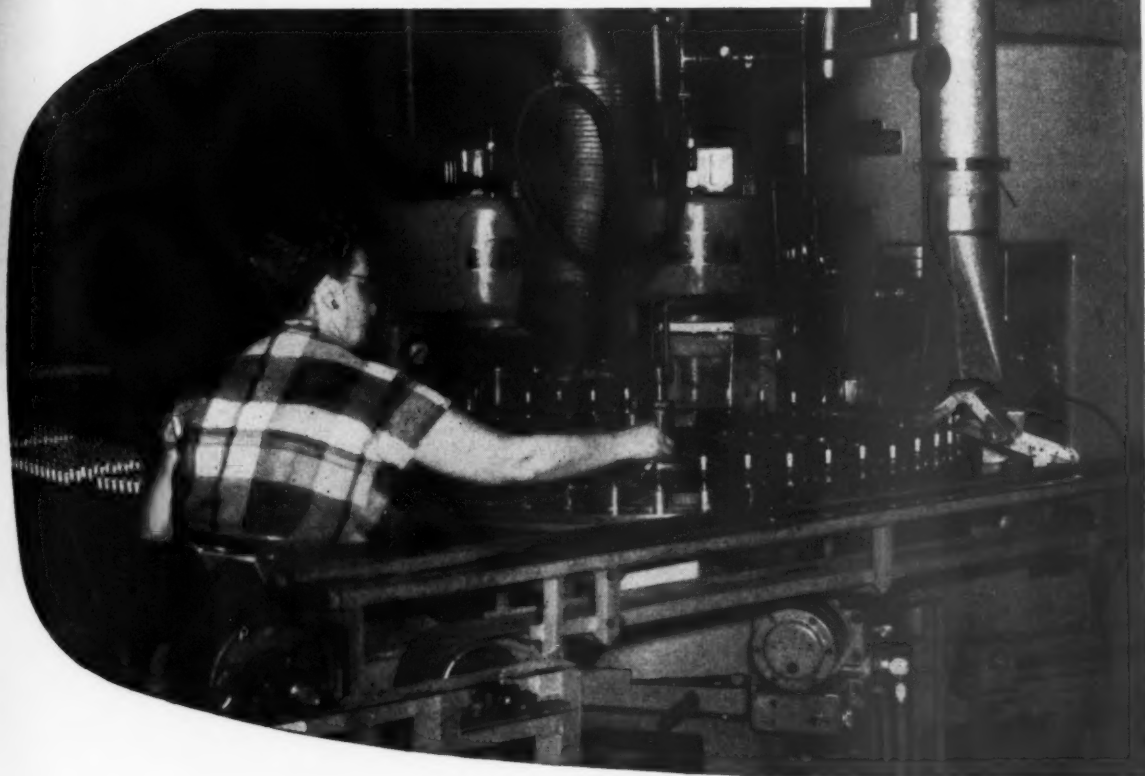
Today, vinyl plastics are used in paints and in floor coverings themselves. One manufacturer has a combination of two vinyl plastics with a chlorinated rubber bonding agent which provides penetration, sealing, binding, and filling actions. Products of this type are impervious to efflorescence or lime action and do not usually require the etching, naturalizing, etc., operations, thus saving time and labor in application. They also dry quickly to a hard, walk-on film in 20 to 40 min.

Proper application of these materials extends the life of floors greatly and leaves them more dust free, more sweepable and easier to clean. Floors treated with these products are extremely resistant to stains and soil as well.

Wood floors or wook block floors must be sealed as an act of preventive maintenance and good housekeeping. The recommended treatment for wood floors of all types, whether hard or



## AUTO-LITE BOOSTS PRODUCTION HYDRAULICALLY...



## MULTIPRESS<sup>®</sup> installation automates assembly operations

- ★ Sets new safety levels
- ★ Reduces tool and die costs, eliminates down-time
- ★ Improves product quality, provides for future expansion

The installation of seven 48-station Multipresses at the Fostoria, Ohio, plant of Electric Auto-Lite has introduced added efficiency into a critical production stage — final assembly of spark plugs.

One unit with a single operator (1) pre-presses the top gasket of a spark plug to centralize the insulator within the shell; (2) cold forms the shell to anchor the entire sub-assembly as an integral unit; and (3) seals the shell and insulator. These operations had required *three individually operated presses.*

Since Multipress equipment was installed, materials handling has been reduced and tool and die costs cut substantially. Down-time has been virtually eliminated; maintenance can be carried on without interrupting production. Exact control over force application is now possible, with improved product quality control a direct result.

The experience of Auto-Lite is typical of hundreds of companies who have found that a Denison Multipress, with its automatically controlled hydraulic ram, can produce a better product . . . faster, more efficiently, and at less cost. Write for complete details.

### THE DENISON ENGINEERING COMPANY

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A Subsidiary of American Brake Shoe Co.

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS



# 3 TYPES OF "Weld-Bilt" PRODUCTS FOR SAVINGS IN YOUR PLANT...

## CONVEYOR

**WELD-  
BILT  
AUTOMATIC  
CONVEYOR-  
LIFT  
ELEVATORS**



Here's the solution to production flow on latest multiple-level conveyor systems... Weld-Bilt Automatic Conveyor Lift designed to lift or lower packages or parts from one level to another — without manual attention. Automatically selects certain packages, passes others, loading or unloading in any direction, any height. Any capacity, with controls to handle any situation.

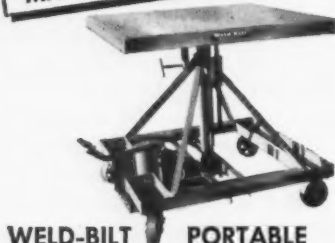
## FLOOR

**WELD-BILT  
HYDRAULIC  
PALLET TYPE LIFT TRUCKS**



Swiftly handle single or double-faced pallets up to 6000 lbs. capacity. Features include — easy-entry booster rollers, "multi-stroke" easy-lifting action, front-wheel equalizers, and others.

## MACHINE FEEDING



**WELD-BILT PORTABLE  
HYDRAULIC LIFT TABLES**

Single Pedestal type, lifts sheets or parts from 28" to 44". Has 30" steel swivel top, locks in any position. Hand operated hydraulic pump or electric controls. Capacity, to 10,000 lbs.

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**WEST BEND EQUIPMENT CORP.**  
MATERIALS HANDLING ENGINEERS

307 WEST WATER STREET • WEST BEND, WIS.

... for more details, circle No. 40

soft, plank, strips or block, is the application of a penetrating seal which will seal off open pores of the wood. Then a finish surface may be applied if desired.

Resilient floors are usually found in non-manufacturing locations or in light manufacturing or assembly locations. They are generally of linoleum, asphalt tile, rubber tile, cork tile, mastic tile, or the newer vinyl plastics. Vinyl plastic resilient floors are being marketed in combinations of vinyls with asbestos, vinyl linoleum, vinyl rubber, and also pure vinyl.

An informal survey made at a recent meeting of one chapter of the Industrial Sanitation Management Assoc. disclosed that the majority of first choices for resilient floors with ease of maintenance was evenly divided among inlaid linoleums, vinyl asbestos tile, and rubber tile. Second choice was between full thick vinyl tile and asbestos tile.

Resilient floors are best protected by a surface finish which may be a natural or synthetic wax or floor finish, or a 100% synthetic floor dressing or floor coating. This type floor should never be sealed, except when it becomes old, brittle, or softened through misuse or poor maintenance.

### Check your cleanser's pH factor

Oils, greases, and fats have a strong tendency to "bleed" the colors of these materials, with the exception of vinyl and possibly linoleum, and to soften the floor to a point where the investment may be a total loss. High caustic cleaning compounds should never be used on these floors. In selecting cleaning agents for resilient type floors a pH above 10 or below 6 is not desired.

Regardless of its composition, once a floor has been properly sealed or protected, the maintenance problem is greatly reduced. Spillage, soil, and stains are readily removed. Illumination is improved because of better reflected light permitting higher production and neater work. Litter and other hazards are more visible on the floor and fewer accidents occur due to the greater visibility. Proper protection and maintenance of the floor results in longer life to the property, more satisfaction to the management, better employee-customer relationship through more pleasant working conditions and easier housekeeping.

Safety department programs, industrial hygiene and medical services, regardless of how well administered, will never be fully effective without competent, systematic sanitary maintenance. A sanitary maintenance program, to be fully effective, requires



**VACUUM CLEANERS REALLY PAY** when it comes to effective cleaning of walls, rafters and hard-to-reach areas.

continuous inspection of facilities with overall responsibility and concern for the cleanliness, hygiene, and maintenance of the plant.

It is essential for the success of such a program that it be under separate and responsible supervision, administered from a position of authority and with the full understanding and support from, and responsibility to, top management.

Mechanization in the field of sanitation equipment has been largely overshadowed by advanced and automatic production equipment. However, shortages of custodial labor and increasingly high hourly labor scales have made mechanized maintenance an economical "must."

### Mobility from scrubbing to dusting

One of the most versatile, vital, and valuable floor maintenance tools available today is the modern industrial vacuum cleaner. This fine tool combines power cleaning with mobility and portability never before achieved. Cleaning ability and cleaning capacity have been greatly improved in the past few years. The mechanized cleaners require less labor and less capital expense and will cover more area with less cost than any hand method. Today these machines will clean, dry, dust, and scrub all working surfaces and, even more important, overhead beams, extinguisher systems, ceiling lights, inaccessible corners, and horizontal surfaces.

During the recent floods in California, many industrial vacuum cleaners were purchased to remove large quantities of water from the floors of fac-

# Standard Engineer's Report

CASE HISTORY  
*Calol Vistac Oil*

LUBRICANT

*Hydril Co.,  
Los Angeles, Calif.*

FIRM

## Tacky oil eliminates loss of heavy-duty bearings!

IN 8 YEARS OF USING CALOL VISTAC OIL, the Hydril Co. Los Angeles, has not lost a single bearing in any of the 31 pieces of heavy-duty machining equipment in its plant (below). Calol Vistac Oil is used in bearings in the plant, ranging in size from  $\frac{1}{2}$ " up to the 36" plain bearing that carries the six-ton table on the 84-inch boring mill at right. They report it keeps a lubricating film on bearings under extreme loads, saves the cost of down-time, parts, and labor formerly involved when bearings went out.



USED ON WAYS OF ENGINE LATHES in the plant, Calol Vistac Oil stays in place overnight and week-ends. It eliminates the trouble caused when previous oil drained off these precision surfaces, allowing grit to get into pores of the metal. They also use Calol Vistac Oil in all gear trains except worm drives. It comes in several grades to meet a wide range of operating conditions.

FREE CATALOG: "How to Save Money on Equipment Operation," will be sent on request to Standard Oil Company of California, 225 Bush Street, San Francisco.

FOR EXPERT HELP on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write to 225 Bush Street, San Francisco.



TRADEMARK "CALOL VISTAC" REG. U. S. PAT. OFF.

### How CALOL VISTAC Oil cuts costs in industrial operations




Has wide use range in heavy-duty plain bearings operating in hard service, air cylinders, reduction gears, motor gear-heads, etc.; excellent air-tool lubricant—atomizes quickly and stays fluid at low temperatures.

- A. Additives help form oily, pressure-resistant film...sticks on slow-moving parts and resists high temperatures.
- B. Economical—small quantity will lubricate efficiently, dissipate heat.
- C. Tenacious film cuts power loss and wear.

STANDARD OIL COMPANY OF CALIFORNIA

*from tea strainers...*



*to catalytic crackers...*

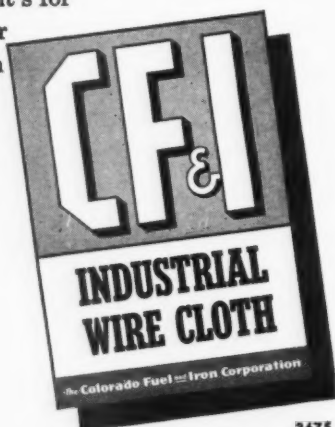
*you will find*



## INDUSTRIAL WIRE CLOTH

It's a versatile product, this CF&I Industrial Wire Cloth. For it plays an essential part in the tiny tea strainer and in the oil refinery's huge catalytic cracker. Chances are that you're using it—or could be using it—to good advantage right in your own operations.

CF&I Industrial Wire Cloth will meet your most exacting specifications—whether it's for screening, filtering, grading, cleaning or processing. That's because CF&I Cloth comes in a wide variety of weaves and meshes and can be supplied in non-ferrous metals, as well as carbon and alloy steels. Why not get the complete details from your nearby CF&I representative today!



3675

**THE COLORADO FUEL AND IRON CORPORATION:** Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita • **WICKWIRE SPENCER STEEL DIVISION:** Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

**CANADIAN OFFICES AT:** Calgary • Edmonton • Vancouver • Winnipeg

... for more details, circle No. 42 on Reader Service Postcard

tories, offices, and warehouses. Thousands of dollars worth of machines, materials, and inventories were saved as a direct result of the use of wet or dry industrial vacuum cleaners.

Frequently you will find industrial vacuum cleaners much at home in the production department. Here, they assist in keeping both machines and floor areas free from litter as well as picking up spillage, wet and dry, from the floors, thus preventing accidents. Vacuums are used as vital adjuncts of production, being coupled with production line specialized uses in many ways.

Today's vacuum cleaners are available in stainless steel resistant to acids, alkalies, and wetting agents. As an accessory, many have specially woven filter bags that will actually shed soot, cement dust, talc, flour, and palpable dusts. They virtually never clog. These specially woven bags are resistant to rot, alkali, acids and extreme high temperatures.

### Polishers branch out

Modern floor maintenance requires the use of the floor polisher. The single-disc and twin-disc polishing machines of today are fast, lightweight, balanced, and ruggedly constructed. Although originally designed primarily for polishing, today they scrub, wax, polish, sand, steel wool and hone floors, and are engineered for practically every heavy-duty type of maintenance.

Mechanical sweepers which are available on today's market range from manually operated units to large riding types which are ideal for large square-footage and unobstructed areas. These giant carpet sweepers will eliminate dirt, dust, and litter from 10,000 to 100,000 sq. ft. per hr. Many users of mechanical sweepers report savings as high as 76%.

Mechanical sweepers or vacuum cleaners, by the elimination of soil and litter, provide better traction for lift and hand trucks and as a result tires and machines last longer. The slip-free uncluttered traffic areas result in safer conditions for the workers and prolonged floor life.

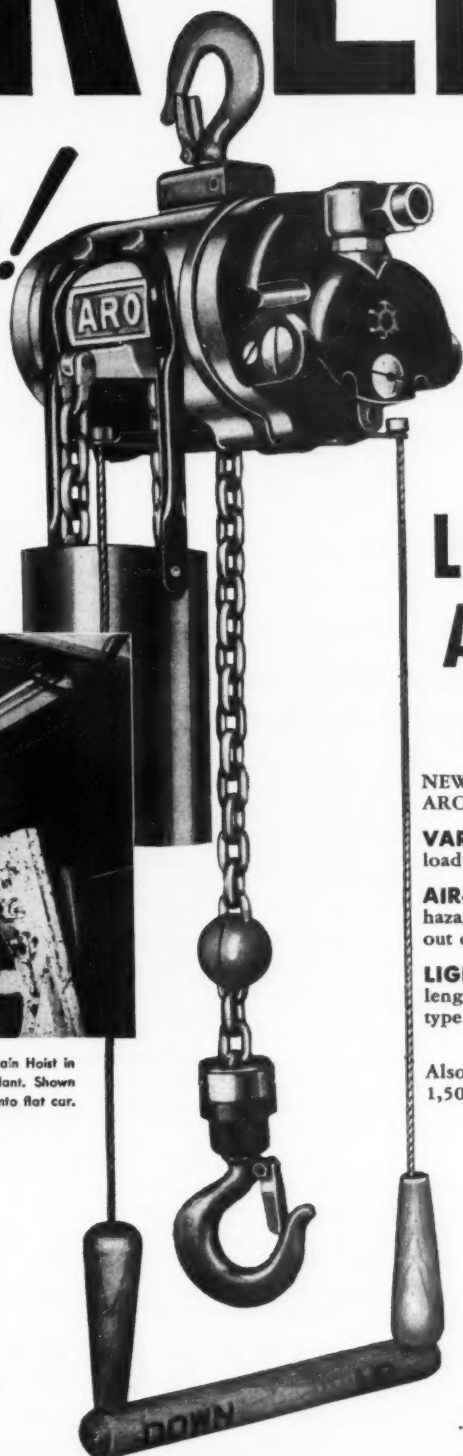
Keeping pace with the latest in automation is a new low priced unit that enables one man to replace three on the janitor scrubbing crew. This new unit will scrub, floor-rinse, and vacuum dry a floor with coverage up to 15,000 sq. ft. per hr. Actual time studies show one man with the unit scrubbing, rinsing, and drying a 6,000-sq. ft. floor in 26 min. Previously it took three men 40 to 45 min. to do the same area.



# AIR LIFT

*Faster!*

*Safer!*



## NEW LINK CHAIN AIR HOIST!\*

**\*ROLLER CHAIN ALSO  
AVAILABLE—ALL MODELS**

NEW Link Chain Hoist now added to the popular ARO line . . . up to 1000 lb. jobs!

**VARIABLE SPEED . . .** 0 to 38' per minute . . . load can be inched or zipped.

**AIR-POWERED FOR SAFETY . . .** no spark hazard . . . explosion-proof motor . . . can't burn out or overheat . . . unaffected by dust or fumes.

**LIGHTWEIGHT . . .** only 29 lbs. . . . overall length 10 1/2". Can be converted to Roller Chain type if desired.

Also available, Roller Chain Hoists—2,000 lb., 1,500 lb., 1,000 lb., 500 lb., 300 lb., 100 lb.

See Your ARO Distributor

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Offices in All Principal Cities



## AIR HOISTS

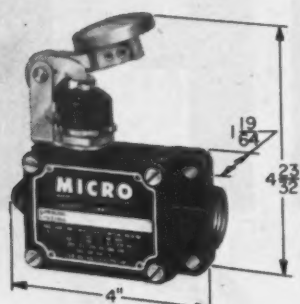
\* Also . . . Air Tools . . . Lubricating Equipment  
. . . Aircraft Products . . . Grease Fittings . . .

. . . for more details, circle No. 43 on Reader Service Postcard

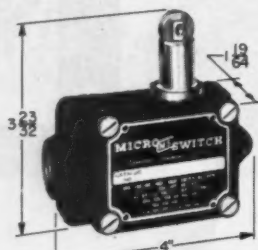
DOUGLAS AIRCRAFT uses ARO Link Chain Hoist in tooling shop at their Santa Monica plant. Shown here, bulkhead fixture being lowered onto flat car.

# MICRO precision switches

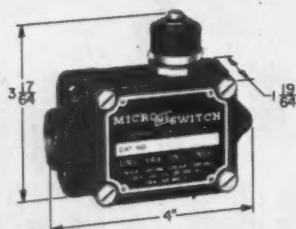
...THEIR USE IS A PRINCIPLE OF GOOD DESIGN



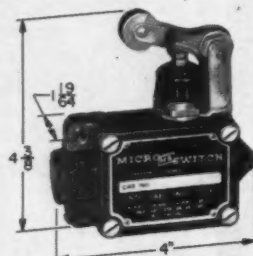
Button-type lever actuator



Sealed roller plunger actuator



Sealed plunger actuator



Sealed roller lever actuator

## High-Capacity enclosed switches for plant applications with heavy electrical loads

Many plant applications call for installation of switches which have more than average electrical capacity. MICRO SWITCH high-capacity enclosed switches meet this requirement with the capacity to make and break steady state currents of 20 amperes, 125, 250, or 460 volts a-c. They will handle inrush currents as high as 75 amperes — switch 10 amperes 125 volts when controlling tungsten filament lamp loads on a-c circuits.

All the types shown are available for either right- or left-hand mounting. They are widely used on present plant equipment as safeties, limits, and interlocks.

**Button-type lever actuator:** This actuator can be adjusted horizontally through 360° and vertically through 225°. The actuator is sealed with an elastomer (neoprene) boot. The switch is for manual operation.

**Sealed plunger actuator:** An elastomer boot covers the operating plunger and a ring gasket seals the cover. Die-cast aluminum enclosure protects the basic switch from vibration and shock.

**Sealed roller plunger actuator:** For cam or slide operation in applications where the approach of the actuating device is not parallel to the switch. Roller plunger assembly adjustable through 360°. Seals prevent entrance of dust, dirt, or moisture.

**Sealed roller lever actuator:** Well adapted to operation by any type of operation—straight line or cam. Roller lever can be locked in any position at intervals of .2 degrees within a range of 225°. Entire roller bracket can be rotated horizontally through 360° and tightened down in any position.

These switches are typical of a wide variety of MICRO precision switches which have proved successful in making existing machinery safer, more automatic, and more productive.

MICRO precision switches are carried in stock by distributors in every key city. Look under "Switches, Electric" in the Yellow Pages.

## MICRO SWITCH

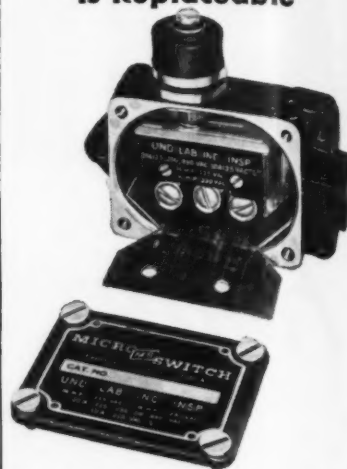
A DIVISION OF MINNEAPOLIS-MONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

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WESTERN INDUSTRY — August 1956

### Basic Switch is Replaceable



The basic switch can be easily replaced, if necessary, without removing the enclosure from its mounting. Ample wiring space within the enclosure and the side facing terminals of the basic switch simplify wiring.

### Underwriters' Laboratories Listing

1 H.P. 115 volts a-c

2 H.P. 230 volts a-c

20 amperes 125, 250, or 460 volts a-c

½ ampere 125 volts d-c

¼ ampere 250 volts d-c

Send for  
Catalog 101  
"Switches  
for  
Industry"



# 50 WELDING MANUALS

## —yours for the asking

Here are reviews of best available manuals covering welding products and processes. Obtain your selection by circling item numbers on rip-out postcard, page 69

**REVIEWED BELOW** are 50 of today's best manufacturer technical manuals covering all phases of just one subject—welding.

Packing in their pages a tremendous fund of the latest know-how needed by buyers and users of welding equipment, the manuals were collected

over the past three months by the editors of **WESTERN INDUSTRY** as a special service to readers. By special permission of the manufacturers, the manuals are made available here free of charge to key production and plant operating men in the West's manufacturing and processing plants.

You are invited to check the listings on pages 65-72 and select those manuals that promise to be most helpful with your welding problems. Circle appropriate key numbers on this month's **WI Reader Service Postcard** and we will be glad to see that you obtain your selection promptly.

### 170-page pocket manual on welding procedures

This 170-page pocket sized book covers simplified welding procedures for every base metal and covers 120 welding rods, electrodes, and welding compounds. It is a guide to improved torch and metallic arc welding, brazing, and soldering with how-to-weld information for fabrication, maintenance repair and salvage, overlaying for wear and corrosion resistance and welding of dirty and rusted parts. Methods of gouging, chamfering and removing unwasted metal without special equipment are covered. (Book TIS 2575) *Eutectic Welding Alloys Corp.* . . . for your copy circle No. 150

### 70 pages on welding, cutting equipment

All types of apparatus used in welding and cutting are detailed in this 70-page book, which covers torches for cutting, welding, and heating, tips, valves, hose fittings, nozzles, regulators, and many more. Each piece of equipment is pictured and identified by model number, then described briefly. Specifications are given and the book concludes with operation data charts. (Catalog 20) *Victor Equipment Co.* . . . for your copy circle No. 151

### 50-page data book on gas, arc welding

Hand and machine apparatus and accessories for both gas and arc welding are pictured and described in this 50-page manual, which treats each type of product in detail. Included are machines, torches, tips, electrodes, and welding clothing, such as gloves, face shields, and goggles. Divided into sections for easy reading. (Bulletin ADC 662B) *Air Reduction Co., Inc.* . . . for your copy circle No. 152

### Complete guide to welding accessories

The 22 pages of this booklet picture and discuss many different welding accessories, including electrode holders, helmets, goggles, shields, cable connectors and splicers, ground clamps, tempilstiks, cleaning tools, and protective clothing. Each individual item is pictured and accompanied by a paragraph of information about it. *Metal & Thermit Corp.* . . . for your copy circle No. 153

### Data on control combinations for welders

Control combinations for spot, projection, or butt welders are explained in this four-page brochure, which pictures the units, lists special features, suggests applications, and points out construction details. Two charts are included, one on standard NEMA types, the other with ordering specifications. *Weltronic Co.* . . . for your copy circle No. 154

### How to get better welds

A welders' vest pocket guide, called "How to Get Better Welds," has 40 pages of information on metals and electrodes. Four essentials of proper welding procedures are given along with pictures of different types of joints, typical positions and the weld best for them, and standard shapes. Picture pages tell about common welding troubles and what to do about them, discuss average electrode consumption, and explain welding symbols. A comparative index of welding electrodes is also given. *Hobart Brothers Co.* . . . for your copy circle No. 155

### How to arc weld and cut with Heliarc torches

Heliarc torches for inert gas shielded arc welding are detailed in a 16-page booklet, which treats six different types. Each is pictured and specifications are given. Treated briefly are electrodes, welding rods, regulating equipment, and accessories. A second four-page leaflet discusses Heliarc cutting of non-ferrous metals, giving complete diagrams of the cutting method and showing pictures of cut samples. *Linde Air Products Co.* . . . for your copy circle No. 156

### 50-page electrode selection guide

Questions about where to use what kind of electrode are answered in this 50-page pocket sized guide. About 35 different electrodes are detailed as to application, color marking, power supply, and chemical and mechanical properties. One page gives arc welding symbols and arrow side examples with explanations. An electrode trouble shooting chart pictures common problems, gives possible causes and corrections. *General Electric Co.* . . . for your copy circle No. 157

### 84-page pocket book on welding electrodes

A complete line of welding electrodes is detailed on the 84 pages of this pocket sized manual. Included are those for welding mild steels, cast iron, alloy steels, stainless steels, and for hard surfacing, along with iron powder and low hydrogen electrodes. The book is divided into sections by type of electrodes and is easy to use. *Harnischfeger Corp.* . . . for your copy circle No. 158

### Data on special purpose resistance welder

A four-page brochure on special purpose resistance welding machinery covers a television tuner welder, door lock, air blower, locker frame, and file card box welder as well as several other types. Eleven machines are detailed in all with each pictured. *Banner Manufacturing Co.* . . . for your copy circle No. 159

### How to operate a welding outfit

Step-by-step instructions for operating a welding outfit are given in this 24-page brochure. It opens with a discussion of the oxygen and acetylene to be used, tells how to clean off cylinder valves, connect regulators to cylinders, attach and flow out hose lengths, attach torch, and adjust gas pressure before welding. All operations are well illustrated, but lighting the torch and adjusting the flames are shown in more detail. Book concludes with a welding nozzle selector chart, a cutting tip selector chart, and a list of 14 safety suggestions. *National Welding Equipment Co.*

... for your copy circle No. 160

### Application data for 34 welding electrodes

Opening with an electrode selector which includes uses and characteristics, color code and number of electrodes, this 36-page book continues to picture and explain uses for 34 welding electrodes. A detailed description of the electrode is included along with its special uses, welding procedure, mechanical properties of deposited metal, specifications with which it complies, and a chart of recommended amperage and voltage range. (Bulletin WE-165) *A. O. Smith, Corp.*

... for your copy circle No. 161

### Two Weldirectories for steels, metals

Two Weldirectories of 28 pages each treat stainless steels, non-ferrous metals, cast iron, manual hardsurfacing, and mild steel, and low-alloy, high-tensile steel. Each electrode is described and application, properties, procedure, and current range are all given. A key to electrode identification is included along with information and procedure pointers on shielded arc welding and jetwelding. (Books SB-1351, 2) *Lincoln Electric Co.*

... for your copy circle No. 162

### Data on complete welding equipment line

Weldit's complete line of welding equipment, accessories, and supplies is covered in this 26-page catalog. Each item is pictured and described briefly, and the line includes complete welding outfits, torches, tips, and blowpipes. Line drawings are used to explain construction features of the different equipment. (Catalog 495) *Weldit, Inc.*

... for your copy circle No. 163

### Machine catalog for resistance welding

This 12-page catalog on machines for electric resistance welding is divided into four sections. The first on industrial applications has three case histories involving mild steel, stainless steel, and aluminum. A section on operation gives explanations of single-phase, three-phase, and three-phase Modu-Wave machines accompanied with photographs and schematic drawings. Specifications for resistance welders are also included in a third section. The final section looks behind the scenes in the manufacturer's plant. (Bulletin 333) *Sciaky Bros., Inc.*

... for your copy circle No. 164

### How to join and cut stainless steels

"The Joining of Crucible Rezistal Stainless Steels" is a 22-page pocket sized book detailing the various methods employed in joining stainless steel by fusion processes. It was written by Jack Goodford, chief welding engineer for Crucible, and explains 17 methods which may be used, including manual, automatic, and semi-automatic welding, brazing, and soldering. The booklet also has a section describing eight flame and arc cutting procedures commonly used for severing stainless steel. *Crucible Steel Co. of America.*

... for your copy circle No. 165

### Spot welding of low carbon steel

Single impulse and pulsation spot welding of low carbon steel is explained in this brochure, which tells how to make and test a spot weld. Preparation of the material to be welded, preparation of parts, setting up the welding machine and carrying out the operation are all outlined. Welding data charts conclude the eight-page book. *Taylor-Winfield Corp.*

... for your copy circle No. 166

### 50-page pocket electrode selector

Westinghouse's pocket electrode selector is divided into sections covering electrodes for mild steel, powdered iron, low alloy steel, cast iron, hard surfacing, automatic welding wire, and stainless steel. Description and application information is given for each type of electrode, along with procedure for welding, physical properties, recommended current ranges, and a list of the code requirements met. (Catalog 26-000) *Westinghouse Electric Corp.*

... for your copy circle No. 167



**SEATTLE**  
**SAN FRANCISCO**  
**LOS ANGELES**

## Faster Service on **DEPENDABLE** Dick Power Transmission and Conveying Equipment

**3 CONVENIENT WEST COAST SERVICE CENTERS**

FACTORY SALES REPRESENTATIVES FOR *Atlas Roller Chain • Sewall Roller Chain Sprockets*

**BARRY STEEL SPLIT PULLEYS**



Scientifically designed. Electrically welded. Light weight. Easily installed. Maintain exact shape under all loads.

**DICK ROPE QD SHEAVES**



Heavy duty "quick-demountable." On or off shaft in minutes. No wobble or loss of balance. 802 stock sizes fit over 25,000 stock drive combinations from 1/2 to 600 hp. Also . . . stock V-Belt drives and "special" sheaves for every application.

**DICK'S BALATA BELTING**



Hard surface, closely woven duck, thoroughly impregnated with Balata Gum. Free from stretch and shrinkage. Moisture resistant. High transmission efficiency.

**BARRY CONVEYOR PULLEYS**



Light weight combined with super strength. Welded steel construction. Easily installed. Wide range of sizes for all general conveyor services.

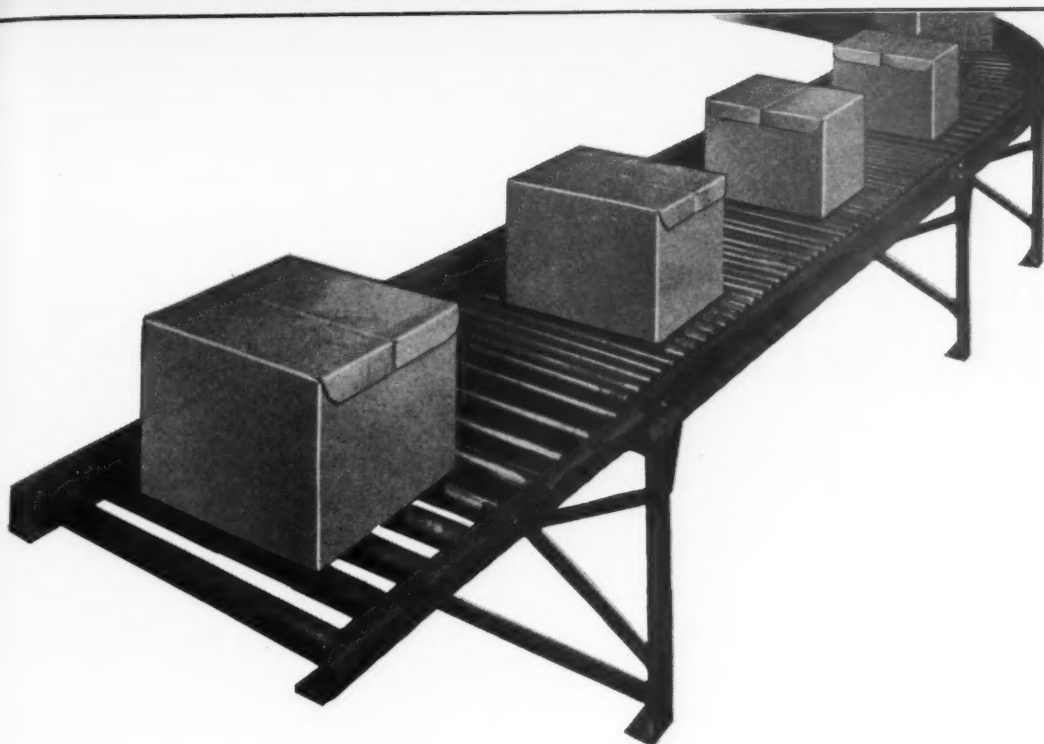
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in tight places



The Ridge Tool Company, Elyria, Ohio, U. S. A.

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68

## 40 pages on cutting, heating, welding equipment

This 40-page booklet is divided into 12 sections which cover cutting assemblies, cutting torches, fluxes, goggles and eyeshields, hose, combination welding and cutting outfits, regulators, tips, torches, and welding torches. Each piece of equipment is pictured and discussed with all pertinent information given. Special features are pointed out on cutaway drawings. A price list, designed to go with the catalog, is included. (Catalog 756) **Smith Welding Equipment Corp.**

. . . for your copy circle No. 148

## Principles, practices of resistance welding

This 28-page booklet is a complete manual on resistance welding, opening with an explanation of it and a resistance welding formula and continuing to explain thoroughly spot, pulsation spot, flashing projection, and seam welding. Each type is illustrated with pictures and diagrams; examples and solutions of welding problems are given. (Bulletin PP-54) **Federal Machine & Welder Co.**

. . . for your copy circle No. 149

## Line of resistance welding products, accessories

Weldaloy's line of resistance welding products and accessories is covered in this 56-page catalog, which describes and illustrates standard and special spot welding electrodes, seam welding electrode wheels, dies, back-up bars, shafts, and bushings. Sections are devoted to recommendations and usage of special alloys and electrode materials, and specification charts on physical and mechanical properties of Weldaloy alloys. A glossary of metallurgical processing and production terms concludes the book. **Weldaloy Products Co.**

. . . for your copy circle No. 150

## Picture book on electronic welding machine

Opening with a complete explanation of the automatic shielded arc welding process, this brochure continues with a group of large pictures showing the automatic electronic welding machine in action. Pictures also point out some of the features of the machine: it welds in different directions, can be used on high or low jobs, makes weldments in many sizes and shapes. The electronic controls are pictured and explained, and specifications for the machine are given. (Bulletin 83-A) **Niagara Machine & Tool Works.**

. . . for your copy circle No. 171

## Three leaflets on air operated spot welders

Two of these leaflets are devoted to air operated press-type spot and projection welders. They each have pictures and drawings of the welders, and discuss timers and contractors, pulsation welding, air equipment, heat regulation. Special features of each unit are mentioned and specifications and general capacity information given. (Bulletins 73, 74) The third leaflet gives similar treatment to rocker arm-type spot welders. (Bulletin 52-B) **Acme Electric Welder Co.**

. . . for your copy circle No. 172

## Data sheets on weld preheating, stress relieving

Three data sheets on pipe weld preheating and stress relieving by a system of low frequency induction heating give information about using pre-formed coils and water-cooled coils. Advantages of each are listed and accompanied with technical data and chart information. Loss frequency induction heaters are pictured and discussed and their specifications given. **Electric-Arc, Inc.**

. . . for your copy circle No. 173

## Stud welding ferrous and non-ferrous metals

This is the title of an eight-page section reprinted from an engineering handbook. It explains in article form the stud welding process, some of its advantages, how to weld different metals, and the technique's general limitations. The article is well illustrated with pictures and line drawings. **Nelson Stud Welding Division, Gregory Industries, Inc.**

. . . for your copy circle No. 174

## Two booklets on welders, accessories

An eight-page booklet pictures and details many different types of electric motor-driven arc welders, gasoline engine-driven arc welders, and an a-c. power-welder combination. Charts give information on type of mounting, motor rating and speed, generator rating, welding range, weight, and overall dimensions. A section on "build your own" generators is included. The final page is devoted to welding electrode charts. (Booklet EW-189) A second book on accessories covers shields, lenses, hats, and other clothing, and cleaning tools, electrode holders, welding cables, clamps, etc. (Booklet EW-191) **Hobart Brothers Co.**

. . . for your copy circle No. 175

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### Pocket guide to choosing an electrode

How to pick the right electrode is explained in this pocket sized electrode guide. It explains mechanical properties and testing, conformance and approvals, and filler metal specifications. A two-page chart gives classifications and properties of electrodes. This is followed by pictures and discussions of electrodes suited for cast iron, mild steel, high tensile steels, low hydrogen weld metal, stainless steels, and non-ferrous metals. A stainless steel electrode comparison chart concludes the book. *Air Reduction Co., Inc.*

... for your copy circle No. 176

### Application manual for hard-facing products

Among the applications for hard-facing products covered in this manual are 11 in the brick and clay industry, 12 in coal mining, 15 in dredging, 33 in earth moving, 24 in metal mining, and 12 in the field of rock products. Each application is illustrated with a large picture, which is accompanied by a brief paragraph discussing the application. What to use for each application is also mentioned. *Victor Equipment Co.*

... for your copy circle No. 177

### A welding equipment buyers' guide

"Which welder is best for your operation?" This is the question that this buyers' guide sets out to answer in 20 pages. In the process it covers rectifier welders, heavy-duty, general purpose, motor generator, engine-driven, semi-automatic, and automatic welding equipment. Each is pictured and described with applications suggested. A complete line of holders and torches is pictured and described, as well as welding accessories and special clothing. *General Electric Co.*

... for your copy circle No. 178

### Engineering data on arc welding electrodes

This 35-page book has descriptive information, chemical and physical data, and engineering data for mild steel and low alloy arc welding electrodes. Engineering data includes AEC steels and supporting tables, preheating, estimating, weight, hardness comparison, wire and sheet metal gage, and a section on standard welding symbols. About 20 different types of electrodes are detailed in this two-color book. *Metal & Thermit Corp.*

... for your copy circle No. 179

### Data on metal inert gas welding process

Welding-arc, a metal inert gas welding process, is thoroughly explained in this eight-page brochure, which tells what the weld can do, where you can use it, and pictures five different types: fillet, lap, butt, plug, and cross section. The components of the system are pictured and explained in detail. The final section of the booklet covers physical properties in diagram and chart form. *Westinghouse Electric Corp.*

... for your copy circle No. 180

### Recent developments in inert-arc welding

Current applications of inert-gas tungsten-arc and metal-arc welding with an eye to reducing manufacturing costs is the subject of this article written by F. J. Pilia and reprinted from the *Welding Journal*. Article includes process developments, applications, and considers what factors are involved in choosing welding processes for specific jobs and whether or not welding should be manual or automatic. *Linde Air Products Co.*

... for your copy circle No. 181

### Data on 40 arc welding electrodes

Over 40 arc welding electrodes are treated in this brochure in terms of color identification, applications, procedure, physical properties, and recommended currents. A great many application pictures are included. Accessory welding items are treated briefly at the close of the book. *Hobart Brothers Co.*

... for your copy circle No. 182

### Details about electronic welder control

A predetermined electronic counter welder control is detailed in a brochure which is divided into two sections: development of the welder control and specific features of it. A full page picture of the controlled welder is included. Features explained include dial calibration, plug-in sub-assembly, and tubes. (Bulletin 338) *Sciaky Bros., Inc.*

... for your copy circle No. 183

### Applications for sequence weld timers

Application data and special features are given for sequence weld non-synchronous relay firing timers. Several different types of timers are pictured and detailed. Complete specifications are included. *Electronic Co.*

... for your copy circle No. 184



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# HELPFUL LITERATURE

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## 48-page manual on bearings, parts, filters

Opening with the Oilite process and a discussion of products, this 48-page manual is divided into three sections: bearings, finished machine parts, and permanent metal filters. Typical properties, design, lubrication, and machining of bearings is included, while the parts section covers properties, design features, and machining. A short section on special parts concludes the book, along with case histories. Many charts, pictures, and diagrams are included. *Amplex Division, Chrysler Corp.*

... for your copy circle No. 201

## How to install steel floor tile

Methods of installation for steel floor tile are explained in a four-page brochure which gives step-by-step pictures of what to do from the arrival of the tile to the final step in making the floor. Construction features of the tiles are explained and applications suggested. (Folder 623) *Bethlehem Pacific Coast Steel Corp.*

... for your copy circle No. 202

## 32 page booklet on choosing solenoid valves

A 32-page condensed valve catalog explains the latest designs in Automatic Switch's line of two, three, and four-way solenoid valves. It contains engineering information, flow charts, operation and construction details, illustrations, and prices. A selection chart will tell the reader at a glance which valve will suit his requirements. *Automatic Switch Co.*

... for your copy circle No. 203

## Introduction to new All-Weather motors

This brochure introduces new 10 and 15-hp. All-Weather single phase motors developed by Robbins & Myers. The four-page leaflet describes the capacitor-start, capacitor-run motors, which are available in 1,725 and 1,140 rpm. speeds, and lists eight features. *Robbins & Myers, Inc.*

... for your copy circle No. 204

## 56 pages on simplified drafting practices

"Standard and Simplified Drafting Practices" is a 56-page book devoted to standards of drafting room practice and techniques of simplified drafting. All basic drafting operations are comprehensively treated and four pages are given to helpful data on general procedures. The 24-page section on simplified drafting opens with 11 basic rules and covers the specifics of simplified practice. Also included is a speech by Jay H. Gergen, AMF standards administrator, on drafting. Well illustrated with drawings. *American Machine & Foundry Co.*

... for your copy circle No. 205

## 34 pages on industrial lifters, trucks, tables

This 34-page booklet includes a list of features, specifications, product and application pictures for the Leverlift, Leverlift double-faced pallet truck, leveler, four-post lifter and several other lifters. The final section of the booklet is devoted to special job-designed equipment pictured in action. *Colson Corp.*

... for your copy circle No. 206

## 148 pages on complete line of roller chain

Link-Belt's complete line of roller chain and sprockets is described in this 148-page book, which includes sections on stock drives, drive chain, conveyor chain, installation and maintenance, lubrication, sprocket wheels, casings, chain tighteners, and many other items. Thoroughly illustrated, the book is designed to give the information necessary for choosing the right roller chain for a given application. *Link-Belt Co.*

... for your copy circle No. 207

## Facts on heavy, medium, light-duty casters

Casters designed for extra heavy duty, heavy, medium, and light duty are detailed in this 20-page two-color booklet, which pictures each different type of caster covered, and lists design and special features. Included is a chart for each caster giving wheel diameter, load capacity, tread width, overall height, swivel radius, etc. (Catalog S-56) *Bassick Co.*

... for your copy circle No. 208

## Guide to improving handling methods

"Materials in Motion" is a 12-page materials handling guide designed to show you how to improve materials handling methods, reduce damage to parts and components. Construction of the Kennett receptacles designed for materials handling is discussed along with their advantages. Case histories are also included. *National Vulcanized Fibre Co.*

... for your copy circle No. 209

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72



## Fact book on air-gas torches

Types of air-gas torches covered in this 36-page brochure include the ribbon flame, bench crossfire, cannon fire, and a special blowpipe. Several pictures of each type are included along with pertinent data in brief form. A section on air-gas mixers, one on hose connections, and one on tips complete the booklet. *National Welding Equipment Co.*

... for your copy circle No. 185

## Data sheet on stainless steel electrodes

This 16-page data sheet on stainless steel electrodes, a-c. and d-c. welding, and bare welding wire is indexed for easy reference. Sections include electrode analyses, descriptions, dimensions, coatings, the welding procedure and finally, a table of recommended current ranges for a-c. or d-c. welding. Included with the book is a comparative index of stainless steel electrodes which includes listings from 16 other companies in addition to Crucible. *Crucible Steel Co. of America.*

... for your copy circle No. 186

## Basic types of resistance welders

A 12-page booklet describes the basic type of resistance welders and suggests applications for them. Spot, projection, flash butt, seam, and roll-spot welding are all explained and illustrated with drawings. Types of welders detailed include portable or fixture, bench, rocker, projection press, seam, and circular, longitudinal or universal types. A short section is included on resistance welding engineered specifically for a job. (Bulletin SP 353) *Federal Machine & Welder Co.*

... for your copy circle No. 187

## Picture book on Aircomatic welding equipment

Aircomatic guns, heads, control equipment, accessories, and wire are covered in this 16-page booklet. Individual pieces of equipment are pictured as well as equipment in use. The Aircomatic system of welding is explained and illustrated with a schematic diagram showing how the component parts work. Specifications and ordering data are given also. (Booklet ADC 717G) *Air Reduction Co., Inc.*

... for your copy circle No. 188

## Welding and cutting accessories, supplies

A 38-page book pictures and describes many cutting and welding accessories and supplies, including clamps, clothing, cutting machines, tip cleaners, electrodes, welding machines, hammers, pipe patterns, positioners, etc. Specifications are included, along with pictures of some of the equipment in action. (Catalog 24) *Victor Equipment Co.*

... for your copy circle No. 189

## Data on positioners for welding downhand

Four welding positioners with capacities of 3,000, 6,000, 16,700, and 36,600 lb. are described in this brochure. Each is illustrated and information given includes table tilt speed, table turn speed, motor information, weight. Each is accompanied with a load table also. Construction features of the positioners are explained and a list of advantages given. (Bulletin P1-3) *Harnischfeger Corp.*

... for your copy circle No. 190

## Introduction to a-c., d-c. Idealarc welder

This eight-page booklet details the combination a-c., d-c. Idealarc welder and some of its advantages. It illustrates where a-c. and d-c. current are best suited, and when to use hot starting and cold starting. An explanation is given about the machine's production of either a soft or penetrating arc; controls are explained and pictured. Charts are included. (Bulletin 1343) *Lincoln Electric Co.*

... for your copy circle No. 191

## Data on 7 resistance welders

Seven resistance welders—bench, rocker arm, press, seam, butt, multi-electrode, and tri-phase—are covered in this 12-page brochure. Several different models within each type range are pictured and their specific functions outlined. Brief mention is made of portable welders, transformers, controls, and solenoid-operated air valves. (Catalog SP1-A) *Taylor-Winfield Corp.*

... for your copy circle No. 192

## Two leaflets on foot-operated spot welders

Two leaflets of four pages each picture and describe foot-operated spot welders of four different types. These are all rocket arm-type spot welders but individual characteristics of each are pointed out. Specifications are given along with general capacity information. (Bulletins 50-B, 51-B) *Acme Electric Welder Co.*

... for your copy circle No. 193



# HELPFUL LITERATURE

for the West's plant  
operating executives

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... for your copy circle No. 204

## 56 pages on simplified drafting practices

"Standard and Simplified Drafting Practices" is a 56-page book devoted to standards of drafting room practice and techniques of simplified drafting. All basic drafting operations are comprehensively treated and four pages are given to helpful data on general procedures. The 24-page section on simplified drafting opens with 11 basic rules and covers the specifics of simplified practice. Also included is a speech by Jay H. Gergen, AMF standards administrator, on drafting. Well illustrated with drawings. *American Machine & Foundry Co.*

... for your copy circle No. 205

## 34 pages on industrial lifters, trucks, tables

This 34-page booklet includes a list of features, specifications, product and application pictures for the Leverlift, Leverlift double-faced pallet truck, leveler, four-post lifter and several other lifters. The final section of the booklet is devoted to special job-designed equipment pictured in action. *Colson Corp.*

... for your copy circle No. 206

## 148 pages on complete line of roller chain

Link-Belt's complete line of roller chain and sprockets is described in this 148-page book, which includes sections on stock drives, drive chain, conveyor chain, installation and maintenance, lubrication, sprocket wheels, casings, chain tighteners, and many other items. Thoroughly illustrated, the book is designed to give the information necessary for choosing the right roller chain for a given application. *Link-Belt Co.*

... for your copy circle No. 207

## Facts on heavy, medium, light-duty casters

Casters designed for extra heavy duty, heavy, medium, and light duty are detailed in this 20-page two-color booklet, which pictures each different type of caster covered, and lists design and special features. Included is a chart for each caster giving wheel diameter, load capacity, tread width, overall height, swivel radius, etc. (Catalog S-56) *Bassick Co.*

... for your copy circle No. 208

## Guide to improving handling methods

"Materials in Motion" is a 12-page materials handling guide designed to show you how to improve materials handling methods, reduce damage to parts and components. Construction of the Kennett receptacles designed for materials handling is discussed along with their advantages. Case histories are also included. *National Vulcanized Fibre Co.*

... for your copy circle No. 209

# IRA G. PERIN CO.

## Material Handling Equipment

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SERVICE . . . SURVEYS



### Three folders on painting methods and equipment

This eight-page folder opens with a list of six ways to benefit from using the hot spray method of painting, and continues to explain the method thoroughly. A diagram of the system is included. (Booklet F-286). Two other leaflets treat paint heaters and paint pumps giving diagrams, pictures, specifications, and illustrating painting hook-ups. (Booklets IE114B, 1-3100) DeVilbiss Co.

... for your copy circle No. 210

### How to stop algae problems in cooling

A new algaecide designed to eliminate algae problems in cooling systems is described in a four-page leaflet. A table illustrates the algaecide's effectiveness on six different species of algae. The booklet is divided into sections explaining what algae are, what the new algaecide is and how it should be applied. Safety and cost factors are also considered. *Allis-Chalmers Manufacturing Co.*

... for your copy circle No. 211

### 32-page monthly digest covers aluminum news

"Reynolds Aluminum Digest," a monthly publication covering aluminum news, is now available to the metalworking industry; it was formerly distributed only to Reynolds' employees. The digest is a 32-36 page publication which contains 50 to 60 reviews of articles relating to aluminum that have been published in the technical press during the preceding 30 to 60 days. A summary of related current events is also included. To be placed on the mailing list for the publication, circle number below. *Reynolds Metals Co.*

... for your copy circle No. 212

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... for more details, circle No. 52 on Reader Service Postcard

### 40-page design data book on investment castings

Design data for investment castings are outlined in this 40-page book, which includes typical physical, mechanical, and chemical properties of 26 investment-casting alloys. Helpful hints as to when to consider the investment-casting process to solve design, production, and metallurgical problems are given and supplemented with photographs and case histories of some of the parts produced by the investment-casting method. (Booklet F300017) *Haynes Stellite Co.*

... for your copy circle No. 213

### Specification book for variable speed transmission

A line of variable speed transmissions for machines using up to 10 hp. V-belt drives is detailed in this specification book, which lists features and applications for four styles. Charts give dimensions, drive data, shaft assemblies and applications for various belts. Well illustrated. *Maurey Manufacturing Corp.*

... for your copy circle No. 214

### 12-page booklet on "Any Feed-Speed Paks"

"Any Feed-Speed Paks," designed to simplify fluid power application and provide precision fine feeds and high traverse speeds, are described in this 12-page booklet, which has four oil flow diagrams, information on oil and electrical circuits, typical machine cycles, electric controls components, and pump and base installation drawings. (Booklet 44200-A) *Oilgear Co.*

... for your copy circle No. 215

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WESTERN INDUSTRY — August 1956

75

# Materials handling is faster with the economical **R-W "460"**

the only  
completely packaged  
continuous power  
chain conveyor!

Here's an overhead conveyor designed to meet the light-load handling needs in your plant. It's the R-W "460"—a unique, continuous power chain conveyor—with three outstanding advantages: requires no special engineering; easily adapted to any plant layout; and it can be quickly installed by your own personnel.

Shipped completely packaged from stock, the R-W "460" combines unusual flexibility, convenience and safety with special economies due to lower load limits. Use it as a supplementary conveyor unit on production lines, drying ovens, washers, paint sprayers, degreasers and similar operations in which a heavy-duty conveyor is not required.

\*Ask for descriptive Richards-Wilcox Catalog A-96.



Shipped from stock throughout the U. S.—in easily handled packaged units. Available up to 200-ft. maximum lengths only, the R-W "460" has capacities of 8½-lbs. on 6-in. centers, or 17-lbs. per lineal foot, and 200-lb. drawbar pull.



Branch Offices: 909 Santa Fe Ave., Los Angeles 21, California  
288 Seventh St., Room No. 5, San Francisco 3, California

... for more details, circle No. 54 on Reader Service Postcard

## 30-page engineering manual on enclosed conductor systems

Opening with a basic description and some of the advantages of enclosed conductor systems, this booklet is divided into sections covering installations, installation procedure, parts, and selection of conductors. The final section gives engineering data—installation instructions for the standard mount, collector dimensions for installation, installation instructions for the lateral mount, tongue and sliding switches. Book has many diagrams and pictures. *Insul-8-Corp.*

... for your copy circle No. 216

## How to speed packaging with steel strapping

Five basic ways to use steel strapping—reinforcing, palletizing and skidding, bundling, baling, and tying—to help speed packaging, lower handling costs and insure safer shipments are given in this 44-page book. A complete description of steel strapping tools and equipment is included also. A section of the book illustrates and describes freight carloading methods, including the anchored load, full floating load, and controlled floating load. *Acme Steel Co.*

... for your copy circle No. 217

## Digest of uses for snap-action switches

Forty-three illustrated descriptions of uses for snap-action switches are contained in this 16-page Micro Tips Digest. Ideas in the booklet have been submitted by plant operating men and describe a wide variety of industrial uses for the switches in improving safety, lowering costs, and increasing production. *Micro Switch Division, Minneapolis-Honeywell Regulator Co.*

... for your copy circle No. 218

## 4-page picture book on internal drive head pulley

This folder explains the advantages of the "head pulley with the motor inside," and pictures the internal drive head pulley in use by contractors, batch plant manufacturers, and aggregate producers. Folder has easy-to-read chart of sizes, dimensions, and operating speeds. *Yuba Manufacturing Co.*

... for your copy circle No. 219

## Information book on blast cleaning cabinet

The EN-2 blast cleaning cabinet for small or intermittent work is described in an eight-page brochure, which has 15 photographs and drawings illustrating the airblast cabinet. Two tables



give dimensions and specifications. Operation of the cabinet is explained along with the abrasive system. Dust control is treated briefly. (Booklet 607) *Pangborn Corp.*

... for your copy circle No. 220

#### Data on Verti-Flo for waste treatment

"Packaged Industrial Waste Treatment" is the title of a four-page leaflet on Verti-Flo, a packaged unit which treats industrial waste. It is composed of a steel or concrete tank through which waste water flows and is cleaned. Diagrams of the unit are included along with an explanation of how it works. (Bulletin 315-92) *Chain Belt Co.* ... for your copy circle No. 221

#### 192-page basic manual on casters and wheels

The largest part of this wheel and caster manual treats industrial casters, devoting sections to light, medium, and heavy-duty types. Each caster is pictured and described, and accompanied with specifications. A list of parts is given for each series of casters. Similar information is included for wheels, and glides, and bumpers are treated briefly. (Catalog 60) *Darnell Corp., Ltd.*

... for your copy circle No. 222

#### Details, specifications for cost-cutter conveyor

Details, specifications, and general information on the cost-cutter conveyor are given in this four-page brochure. The center spread shows the 22 basic conveyor supports and undercarriages. The all purpose belt conveyor is designed for use in industrial plants, factories, on production lines, and in warehouses. (Bulletin 103) *New London Engineering Co.*

... for your copy circle No. 223

#### Specification book on transmission equipment

A full line of power transmission equipment, including flexible couplings, variable speed pulleys and transmissions, and universal joints and motor bases is described in a 12-page illustrated technical brochure. Covered are operating data, horsepower ratings, sizes, and types for many applications and varying working conditions. Over 15 items in all are detailed. (Booklet 1200) *Lovejoy Flexible Coupling Co.*

... for your copy circle No. 224



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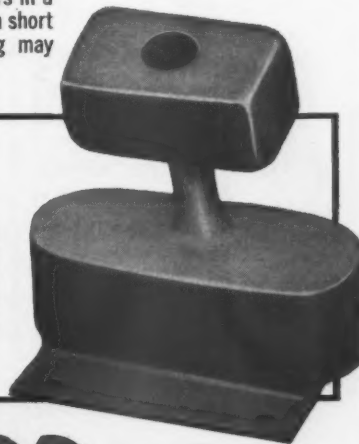
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... for more details, circle No. 55 on Reader Service Postcard



## How to use Metal-Cals for marking, labeling

"Branded for Life" is a four-page booklet which tells how to use Metal-Cals for trademarking, serial numbering, service labeling, catalog and parts numbering, and dial and gage marking. Booklet demonstrates other applications for the aluminum plates and gives a montage layout of typical plates. *C & H Supply Co.*

... for your copy, circle No. 225

## Picture book illustrating uses for coiled cords

A 12-page picture book has more than 25 illustrations showing uses for retractile cords in industry and communications. A discussion of what the cords are, how they work, and where they can be used is included, along with charts on standard types of cords with suggested applications. *Koiled Kords, Inc.*

... for your copy, circle No. 226

## Leaflet on basic changes in cooling tower line

Designed especially for architects, engineers, air conditioning contractors and installers, this four-page brochure details the basic changes in the Wat-R-Miser line of cooling towers. Key improvements in the line are pointed out, such as complete housing water tight seal to prevent leakage at joints, motor guard protection, raised legs. The leaflet is sequentially organized with the idea in mind of making the selection of a cooling tower as simple as possible. Includes specifications and tables. (Bulletin CH 56110) *Drayer-Hanson*

... for your copy, circle No. 227

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Just a  
TWIST  
and the



ratchet's  
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The reversing knob is at the END of the handle to keep fingers from hazardous positions. Its great strength is another safety feature of this Series 20 Gear Wrench.

Handle lengths from 7" to 36". Available with gears to fit hex or square nuts or shafts. Sizes from 1/4" to 2 3/4".

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REVERSIBLE RATCHET WRENCHES

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CLEAN  
PARTS  
3 WAYS!

1. Continuous flow hose.
2. Air agitated soaking tank.
3. Jet air gun.

*The Kleer Flo*  
**SUPER CLEANMASTER**  
has these features:

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- ✓ Continuous filtering—prolongs reuse of cleaning compounds for months without losing efficiency.
- ✓ Safe, efficient pump—driven by fan cooled, brushless, sparkless motor.

**PRACTICAL MFG. CO.**

Minneapolis, Minn.

... for more details, circle No. 96

## 80-page manual on line of backward curve blowers

Forty-eight different backward curve blowers are detailed in this 80-page manual, which pictures each blower, gives wheel diameter, tip speed, inlet and outlet size and area, and complete performance tables. A final section is devoted to diagrams of many arrangements complete with charts. A general discussion of the fans and their construction details is included in a section preceding the technical data. *Master Fan Corp.*

... for your copy, circle No. 228

## Loose-leaf notebook on luminous ceilings

This three-ring, loose-leaf notebook on acoustical aluminum honeycomb for illuminated ceilings and fixture unit lighting is divided into several indexed sections. The first shows many applications of aluminum honeycomb for ceilings, while the second gives complete installation instructions. One section covers troffers and fixtures, another gives step-by-step picture instructions for maintenance. Final section details the manufacture of Hexcel's Honeylite. *Hexcel Products, Inc.*

... for your copy, circle No. 229

## Dressing grinding wheels by abrasive blasting

Advantages of dressing grinding wheels by airless abrasive blasting during manufacture is the subject of this booklet. Increased dressing speed, savings in material, elimination of lacquering in recessed areas and qualities of the finished product are all discussed. (Bulletin 121-D) *Wheelabrator Corp.*

... for your copy, circle No. 230

#### Application book for conveyor belting

After explaining the design and construction of Ton-Tex conveyor belting and giving four comparison charts for regular and heavy-duty belts, this 20-page booklet pictures and discusses belt applications in many fields. Metalworking, automotive, building materials, chemical, and food industries are among those included. Several pictures are included as representative of uses in each field, other uses suggested and the best type of belt to use discussed. *Ton-Tex Corp.*

... for your copy, circle No. 231

#### 16-page booklet on variable speed drives

Variable speed drives with touch control are the subject of a booklet which gives information on features, operating principle, design, component parts, and defines engineering terms and formulas. It also has selection tables and graphic illustrations of drive dimensions. Complete information about Allspeed modifications and accessories is included, as well as pictures of Allspeed drive applications. (Booklet 1600-B7P) *Worthington Corp.*

... for your copy, circle No. 232

#### Data on custom-made valve stem packings

Custom-made valve stem packings in two types—*asbestos yarns* and *plastics*—are detailed in a four-page leaflet from the standpoint of construction and manufacture. The leaflet illustrates the shapes most commonly used and lists size limitations; it also provides a recommendation chart for standard items when used against various fluids and gases. (Booklet 6901) *Raybestos-Manhattan, Inc.*

... for your copy, circle No. 233

#### Details on industrial hydraulic lifts

Four hydraulic lifts helpful for industrial maintenance applications are detailed in this 36-page booklet, which pictures each lift and gives pertinent construction facts in easy-to-read chart form. Included in the book are the bulb snatcher for light fixture and air duct servicing, *Hy-Trailer*, *Hy-Worker*, and *Hy-Deck*. The *Hy-Lite*, a mobile hydraulic lamp stand, is also treated briefly. A montage page shows industrial applications for many of the lifts, and the book concludes with platform specifications. *G. W. Galloway Co.*

... for your copy, circle No. 234

# Cullman announces opening of **NEW** **WAREHOUSE** in **LOS ANGELES**



*carrying a  
complete line of  
Roller Chains  
and Sprockets*

- enlarged stocks
- new facilities
- more space
- parking area

This means you get "off-the-shelf" deliveries promptly and efficiently on your chain drive needs.

Located at 4395 East Olympic Boulevard in Los Angeles, Cullman's new warehouse carries a complete line of Grip-Master and stock sprockets together with roller chains, conveyor chains and flexible couplings. Over 800 different items in stock.

Take advantage of our warehouse services. Next time you need chains, sprockets or couplings—Phone ANgelus 9-9435



**POWER TRANSMISSION  
ROLLER CHAINS AND SPROCKETS**

**CULLMAN WHEEL COMPANY, 1337 Altgeld St., Chicago 14, Illinois.**

... for more details, circle No. 57 on Reader Service Postcard



## Industrial Executives

### CURTAIN RISING COSTS!

#### SAVOLT ENGINEERING ANALYSIS REDUCES UTILITY COSTS...savings up to 20% NO SAVINGS SHOWN...NO COST TO YOU!

Each year American Industry spends millions of dollars needlessly through improper use of utilities. Working in the interest of both user and utility, Savolt engineering specialists increase efficiency of utilization and determine the most economical rate structure. Keep pace with automation and increased labor costs, write or phone for full details on the Savolt Plan today!

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... for more details, circle No. 58 on Reader Service Postcard



### THE Hydro**lectric** LIFT TRUCK

pays for itself ...

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- 2 Drive Wheels instead of one
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The exclusive Hydrolectric modern features give you top performance day in and day out the year around, which today's material handling requires, at the lowest cost.

Write for complete information today!

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**LIFT TRUCKS, INC. / CINCINNATI 14, OHIO**



THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL.

... for more details, circle No. 59 on Reader Service Postcard

### How to select steel processing belts

"A Profitable Approach to the Selection of Steel Processing Conveyor Belts" is a 16-page booklet detailing the Wissco line of standard steel processing belts for most processes requiring a plain or stainless steel belt. Booklet gives complete specifications and outlines a simplified plan for selecting the right belt to meet specific needs. *Colorado Fuel & Iron Corp.*

... for your copy, circle No. 235

### Design data for selecting belt conveyor idlers

Design and application data for selecting and purchasing belt conveyors to handle bulk materials are covered in this 12-page booklet, which has descriptions, dimensional drawings, specification tables, and suggested applications for Limberoller idlers and various troughing, impact, training, and return brackets to use with belt widths of 18 through 72 in. Both bolt-on and portable types of Limberollers are explained. (Bulletin LD-105) *Joy Manufacturing Co.*

... for your copy, circle No. 236

### Specification book on complete coupling line

Browning's complete line of rigid and flexible couplings is detailed in this eight-page booklet which gives complete specifications on all types and includes horsepower rating charts. Types included are fixed bore-type flexible, bushed-type flexible, bushed-type rigid, bushed-type chain, and the minimum bore chain couplings. Illustrated with pictures and diagrams. (V-169-E) *Browning Manufacturing Co.*

... for your copy, circle No. 237

### Catalog on complete line of gravity roller conveyors

A 24-page catalog on Ferguson's complete line of gravity roller conveyors includes photographs and descriptions of the two-in-one conveyor that can be set low for small packages, or turned over and set high for handling packages larger than the width of the conveyor; special and aluminum gravity roller conveyors, and conveyor bearings. Specialty items, including mobile tripod units, special curved and inclined sections, cable reel units, switches, and stops are also illustrated and described. Booklet also has many application pictures. (Bulletin 100) *Harry J. Ferguson Co.*

... for your copy, circle No. 238



## Revamped power and lighting systems

... continued from page 41.

three-phase 120/208-v. banks for lighting service. An existing 25-kva. single-phase transformer is used for lighting the kiln area.

Existing two-tube, 96-in. slim line industrial lighting units were changed from their 15-ft. center mounting pattern and rehung end to end on 10-ft. centers in the forming area. This arrangement developed about 52 ft. candles on the working plane. The remainder of the plant was illuminated with new two-tube 96-in. T-12 slim-line industrial units with a 20% upward component.

In the finishing area, the new units were hung  $4\frac{1}{2}$  ft. end to end on 10-ft. centers, resulting in about 48-ft. candles. In the high bay kiln area similar fixtures were mounted end to end along the building trusses, 18 ft. above the floor and on 20-ft. centers—an arrangement which provides about 32 ft. candles.

In spite of the relatively high level of illumination provided by the new lighting scheme, supplementary light was found desirable at the point of contact of numerous grinding operations. Type PAR spot lights, mounted on the ceiling, answered some of these requirements, but the design of the shielding hoods on the equipment made conventional machine lights necessary on most machines. These are served by small 440/110-v. transformers, mounted on the machine, rather than by separate feeds from the overhead lighting system.

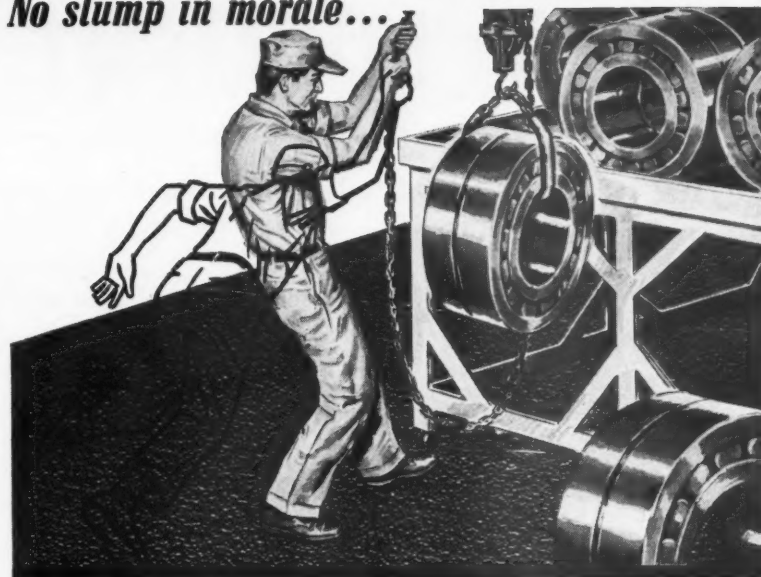
An initial 56 ft. candles of extremely uniform illumination has been provided in the office area of the Norton plant. A luminous ceiling was installed over the 2,500-sq. ft. area. It utilizes 8-ft. slim-line strips on 3-ft. centers and a single thickness of plastic ceiling.

All kilns and ovens are automatically controlled by conventional temperature controllers, and a check maintained by 6 and 12-point recorders.

Electronic excitation is utilized on several variable speed table drives and upon the speed testing equipment, upon which each grinding wheel is speed tested (run at speeds in excess of recommended operating speeds), prior to shipment.

An oscilloscope, complete with beat frequency oscillator and microphone amplifier, is provided to permit measurement of the natural frequency of the grinding wheels, as an additional check upon the quality of the finished product.

## No slump in morale...



## The Accident did NOT happen thanks to A.W. ALGRIP World's only abrasive rolled steel floor plate

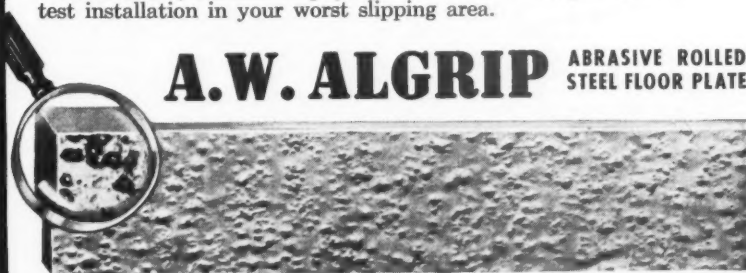
With patented ALGRIP underfoot, men work confidently in dangerous slipping areas—spend more time concentrating on their jobs...

... and management gets a triple advantage—improved morale, reduced accident rates and slashed insurance costs...

because—neither oil, water nor grease can reduce the powerful friction-grip action of ALGRIP's uniformly embedded abrasive particles. Easily fabricated ALGRIP—it can be overlaid or used as a complete flooring—is tough steel plate into which a grinding-wheel type abrasive has been rolled—not coated—to a controlled depth as an integral part of the steel. Wear and tear merely expose more abrasive.

Nationwide, ALGRIP is paying for itself in safety. Make a test installation in your worst slipping area.

## A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE



ALGRIP—approved for safety by Underwriters' Laboratories.

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Other products: A.W. SUPER-DIAMOND Rolled Steel Floor Plate—Plates—Sheets—Strip—(Alloy and Special Grades)

... for more details, circle No. 60 on Reader Service Postcard

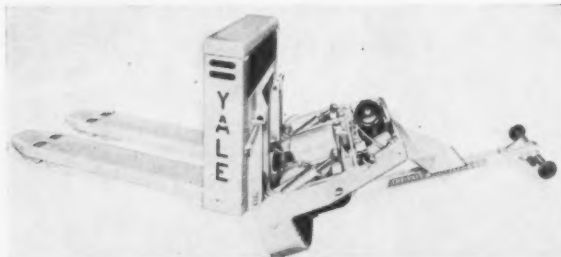


# NEW EQUIPMENT for Western plant operation, production, and maintenance

USE RIP-OUT POST CARD, page 69, for more information on products described.

## PALLET TRUCK

... with breakaway feature for maintenance

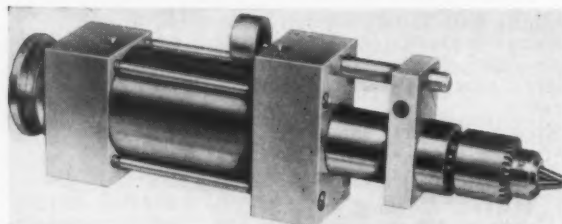


This Worksaver pallet truck has a breakaway feature for easier maintenance. The removal of two pins, one on each side of the truck, permits the whole front of the truck to open away from the battery compartment making every hydraulic and mechanical unit accessible for service. Available in 4,000 and 6,000-lb. capacities, the Worksavers can be fitted with two different sized battery compartments. Short battery compartment models fit a six-cell, 13-plate battery and are only 24 in. longer than the load. The larger model takes a six-cell, 25-plate battery and is 33 in. longer than the load. *Yale & Towne Manufacturing Co.*

... for more details, circle No. 239 on postcard

## PNEUMATIC TOOL

... for rotary and feed motion operations



A pneumatic machine tool designed for production drilling, reaming, tapping, countersinking, and other machining operations that require rotary and feed motions is available in 1½, 3, and 6-in. strokes. Called the Model 150 drill unit, it is rated ½-in. capacity in steel and operates at 9,000 rpm. maximum. The small size permits use in confined spaces; overall dimensions are 2½ x 3¼ x 8 11/32 in. *Alkon Products Corp.*

... for more details, circle No. 240 on postcard

## SEALER-STRETCHER

... with built-in waste cut off shear

This hydraulic powered heavy duty flat steel strapping combination sealer and stretcher has a built-in waste cut off shear. The sealer-stretcher can be used for tying bulky and heavy items such as sheet steel and lumber and will accommodate ¾ and 1¼-in. heavy duty flat steel strapping. *Gerrard Steel Strapping Division, U. S. Steel Corp.*

... for more details, circle No. 241 on postcard

## LOW-PRESSURE BOILER

... for oil and gas firing



Designed to provide steam, hot water heating, or hot water service with power demands of 10, 15, 20, and 25 hp., this compact packaged automatic low-pressure boiler for oil and gas firing is suitable for auxiliary use in industrial plants and warehouses. Called the Power-Pak, it is automatically responsive to load changes, quiet, and fast steaming. It has forced draft, which eliminates the

need of a stack; only a vent is required. Burner is completely mounted on the boiler; ignition transformer is mounted on the air plenum. *Orr & Sembover, Inc.*

... for more details, circle No. 242 on postcard

## CONNECTOR

... joins aluminum to copper conductor



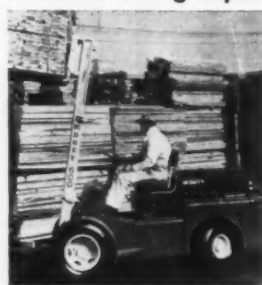
A connector for joining aluminum to copper electrical conductor in severe natural environments consists of a deep aluminum cup and one of copper butt-welded together at the closed ends and hermetically sealed in a rubber ball and cement system. According to the manufacturer, the

Alunector, as the connector is called, eliminates the two principal problems experienced in the past in joining two dissimilar metals: galvanic corrosion and thermo-elastic ratcheting. *Kaiser Aluminum & Chemical Corp.*

... for more details, circle No. 243 on postcard

## HI DUTY LIFT

... with lifting capacity of 6,000 lb.



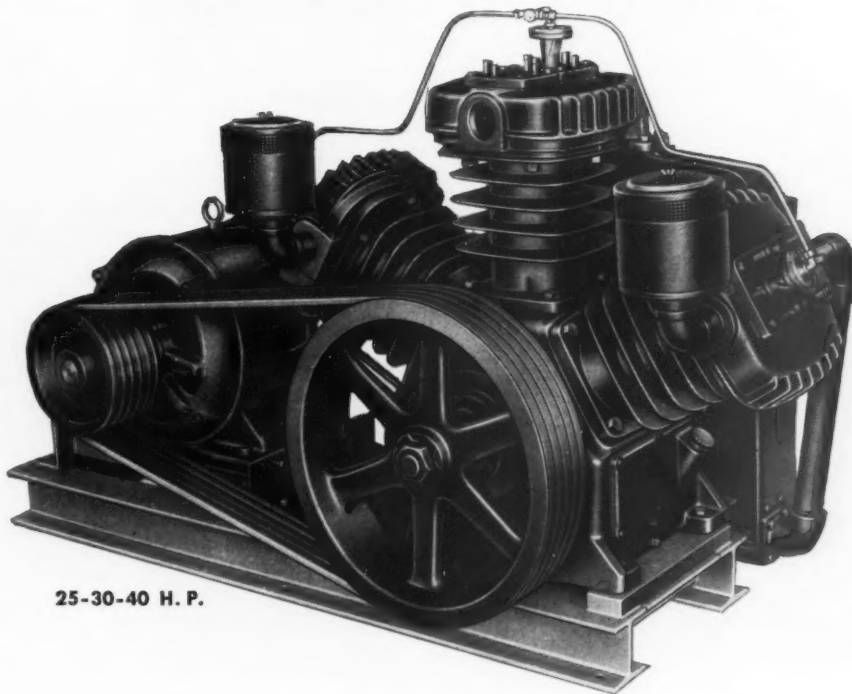
The Hi Duty 600 is a fork lift truck with a lifting capacity of 6,000 lb. rated at 24 in. and with a normal stacking height of 10 ft. It is powered by a six-cylinder, 75-hp. industrial engine and equipped with the duo-drive transmission with two speeds forward and reverse. Overall length without forks is 111 in., width

45 in., and outside turning radius 102 in. *Transit Truck Co.*

... for more details, circle No. 244 on postcard

THE NEW CURTIS MODEL C-100  
TWO-STAGE, AIR-COOLED AIR COMPRESSOR

Provides Higher Operating Efficiency  
Costs Less to Install



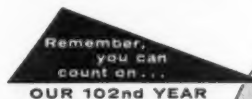
25-30-40 H. P.

**THIS NEW** Curtis Two-Stage will deliver more air per minute, per horsepower and per kilowatt hour of electrical energy consumed, thus assuring a saving in your electrical bill.

It's Air Cooled, thereby eliminating expensive water bills and assuring quick and easy installation with no complicated plumbing problems.

The new C-100 embodies all the well-known Curtis engineering features such as centro-ring oiling and Timken Main Bearings.

*For complete information write for illustrated folder.*



**Curtis**

MANUFACTURING COMPANY • PNEUMATIC DIVISION

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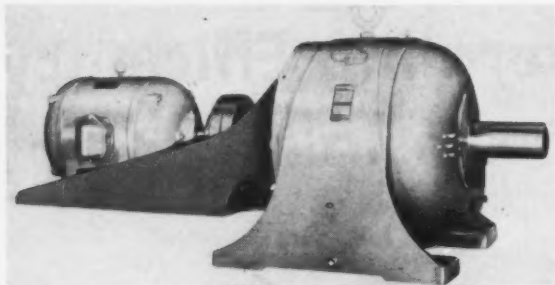
CM-23



... for more details, circle No. 18 on Reader Service Postcard

## MOTORIZED REDUCERS

... with motor support bracket

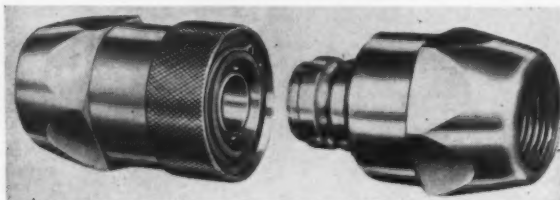


A specially designed motor support bracket is a feature of these motorized reducers. The reducer base supports both the reducer and motor for easy set-up and shaft alignment. Bracket slots are standardized to suit all NEMA motors. Reducer capacity ranges from 1 to 75 hp. while double, triple, or quadruple reductions provide a selection of ratios from 5.06:1 to 238:1. Available in horizontal models for foot mounting or in vertical and vertical extended housing models for flange mounting. *Foot Bros. Gear & Machine Corp.*

... for more details, circle No. 252 on postcard

## QUICK COUPLINGS

... withstand rotation, vibration

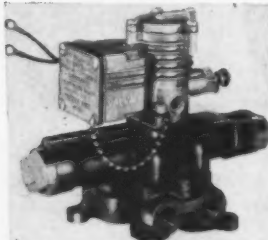


This all-purpose industrial quick coupling in both open and self-sealing types is guaranteed not to uncouple with vibration, pressure or rotation of the hose to which it is attached. The coupling, with a leakproof seal, is locked or unlocked with a simple one-quarter turn. Ball-locking grooves on the nipple are heat treated to assure longer life and higher pressures and the nipple length has been increased to withstand greater sideloads. Available in sizes from 1/2 to 3 in. *Roylyn, Inc.*

... for more details, circle No. 253 on postcard

## SOLENOID VALVES

... with moisture and dust-proof enclosure



A complete line of solenoid pilot-operated control valves, known as the Speed King series, has moisture and dust-proof solenoid enclosure sealed to prevent entrance of splashing liquids or airborne contaminants, safety solenoid cover which renders the valve electrically inoperative when cover is removed, and integral junction box large enough to accommodate 6-in. taped pigtail leads. Junction box has threaded conduit connection and retaining chain on junction box cover keeps cover with valve. Valves will control over 600 cycles per min. *Valvair Corp.*

... for more details, circle No. 254 on postcard

## CIRCUIT TESTER

... for checking hydraulic systems

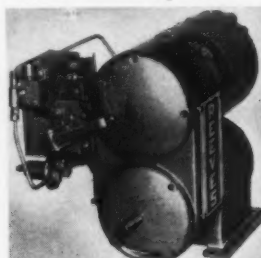


Trouble in a hydraulic system can be checked with this portable hydraulic circuit tester which weighs only 19 lb. and is contained in a light but strong case with carrying handle. With a pressure range of 300 to 2,000 psi., a maximum flow of 50 gpm. and a temperature gage reading from 60 to 220 deg. F., the hydraulic circuit tester simultaneously measures temperature, pressure, and flow from any component port in the hydraulic system. Tester is connected by hose to the component port to be tested and to a low pressure return line. Load is applied manually by the load valve with the result showing on the flow and pressure gages. Screens protect the circuits sensitive to foreign particles. *Schroeder Brothers Corp.*

... for more details, circle No. 255 on postcard

## AUTOMATIC CONTROL

... for Vari-Speed Motodrives

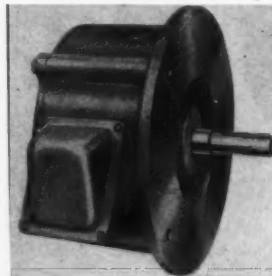


A new automatic control for Reeves' fractional series of Vari-Speed Motodrives is actuated from any pneumatic instrument that gives signals of 3-15 psi. air pressure. This operates an air piston through valving to control the lateral movement of the speed changing mechanism, and in turn the output speed of the variable speed drive. Principal use of the control is in continuous processing applications where the drive speed is required to automatically vary in accordance with changes in liquid level, pressure, temperature, weight, etc. A compensating feature has been built into the controller to secure a true linear relation between changes in input air pressure and variable output speed. *Reeves Pully Co.*

... for more details, circle No. 256 on postcard

## FLAT-TYPE MOTOR

... for machine tool, equipment industry



Designed specifically for use in the machine tool and equipment industries for operating turret lathes, punch presses, milling machines, etc., where there is a minimum amount of space, this flat-type motor in totally-enclosed fan-cooled or totally-enclosed non-ventilated design weighs less than standard motors and is easy to disassemble and reassemble. Flat-type units are of standard radial design, constructed like conventional squirrel cage motors. There are no precision alignments or complicated air-gap adjustments with which to contend. Available in ratings ranging from 1/3 to 7 1/2 hp. *Diehl Manufacturing Co.*

... for more details, circle No. 257 on postcard



*This press at Kenworth's Seattle plant, is stretching 19-gauge USS Steel Sheet and at the same time shaping it . . . a process that puts any material to a severe test. The section being formed here will eventually ride the highways and logging roads as part of the cab housing on Kenworth Tractor units like the one shown at right.*



## When your job calls for a special steel USS Metallurgists see that you get it

For some jobs just any steel will do. But not always . . . not when you have deep draw problems or require difficult shapes like those produced by Kenworth's stretch press. These conditions usually call for a steel with special characteristics. And that's where our metallurgists came in . . . they made sure that Kenworth had the one right steel for the job.

By finding out how you use steel, USS Metallurgists can tailor-make a steel to fit your job requirements. Steel that's made this way, *for a specific purpose*, is the kind of steel that makes your production line run smoothly, reduces rejects and adds to the quality of your finished products. The same metallurgical assistance that helps Kenworth, is available to all customers of United States Steel.

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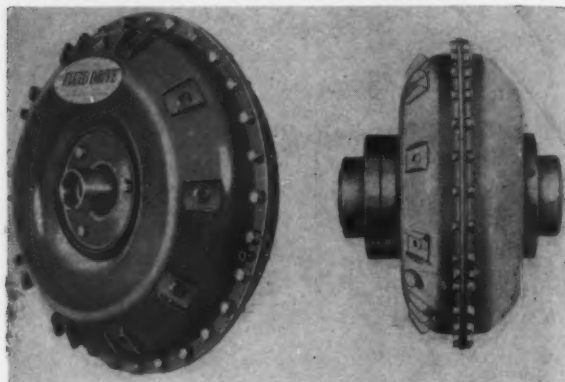


... for more details, circle No. 61 on Reader Service Postcard



## FLUID DRIVE

... for internal combustion engines



This traction type Gyrol fluid drive, designated Size 126, Type T, is designed for industrial use with internal combustion engines as a fluid power transmission for mobile materials handling vehicles and construction equipment. When modified by installation of a flexible coupling half on each end of the fluid drive, the unit is suited for constant speed electric motor applications for driving production and processing equipment, machine tools, and conveyors. As a motor driven unit the Size 126 is rated  $7\frac{1}{2}$  to 15 hp. for 1,200-rpm. drive speed and at 25 to 50 hp. for 1,800 rpm. *American Blower Corp.*

... for more details, circle No. 258 on postcard

## POWER-ROTATED JIB CRANE

... with fraction-of-an-inch control



Available in capacities of 6,  $7\frac{1}{2}$ , 10, and 15 tons, these power-rotated jib cranes are built with fraction-of-an-inch control for smooth handling and exact spotting. Each crane has a 25-ft. boom which, when rotated in a full circle, covers 1,965 sq. ft. of floor space. Cranes have electric rotating mechanism, as well as electrically-powered hoist and hoist trolley. Heavy-

duty electro-mechanical motor brakes and regenerative electric braking action provide absolute control of both boom and load. *R. G. LeTourneau, Inc.*

... for more details, circle No. 259 on postcard

## ADJUSTA-PAK

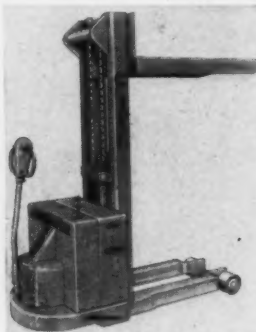
... eliminates need for many boxes

Adjusta-Pak is composed of eight pieces of scored and slotted corrugated board with no right or left sides and no top or bottom. They are telescoped together to form an outer container and secured with steel strapping. This type package eliminates the need for cartons of just the right size, cuts down the expense of custom cartons, and reduces the amount of storage space needed. The range of commodities which can be packed in these containers is almost limitless, according to the manufacturer. The box was designed to make possible the overpacking of non-standard orders which ordinarily require large quantities of containers in assorted sizes. *Signode Steel Strapping Co.*

... for more details, circle No. 260 on postcard

## BATTERY-POWERED HAND TRUCK

... lifts to a height of  $70\frac{1}{2}$  in.



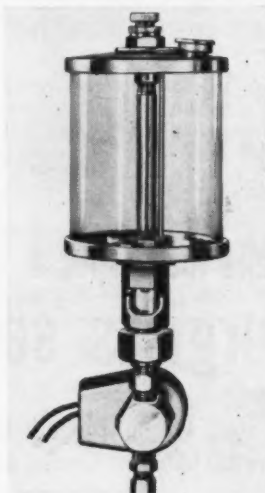
The Hi-Lift Platform, a recent addition to Clark's Powrworker line of industrial trucks, is a 4,000-lb. capacity battery powered hand truck with a lifting height of  $51\frac{1}{2}$  through  $70\frac{1}{2}$  in., and a down height of  $6\frac{1}{2}$  or  $10\frac{1}{2}$  in. Available in two models, the truck travels 3 mph. when empty and 2.2 mph. fully loaded in both forward and reverse. Full-load lifting speed is 9

ft. per min.; lowering speed is 20 ft. per min. Lowering speed is hydraulically adjusted to weight carried. Other features include spool-type lift control valve, built-in pressure relief valve which automatically protects the hydraulic system against excessive pressures, "dead man" brakes, fingertip controls. *Clark Equipment Co.*

... for more details, circle No. 261 on postcard

## OILER

... to flood or flush a bearing



These flushing drop feed oilers provide a means of automatically flooding or flushing a bearing with a definite amount of oil at the starting period, after which the oil will feed drop by drop. Quantity of oil provided for flushing is fixed, while drop feeding can be adjusted. The drop feeding can be observed and adjusted within a wide range on the sight feed valve and any setting retained by means of a friction screw. This unit was designed primarily to meet the lubricating needs of high speed heavier load machines. *Oil-Rite Corp.*

... for more details, circle No. 262 on postcard

## HYDRAULIC TORQUE CONVERTERS

... for general industrial application



Available in range of 100 to 1,000 hp., these single stage, heavy-duty torque converters come in six basic sizes, which include 17 power capacities in closely spaced ranges for matching with engines and electric motors. These power ranges are provided by modification of the converter hydraulic circuit. The three hydraulic elements—pump, turbine, and stator—are aluminum alloy castings. *National Supply Co.*

... for more details, circle No. 263 on postcard

features:

- Utilizes new 800 MA high output lamps.
- May be mounted within 12" of ceiling.
- Meets ASA school standards.
- High adaptation level with low brightness and brightness ratios.
- Flexible in arrangement.

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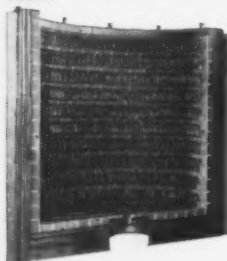
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## POSITIVE TEMPERATURE CONTROL—No Over-Heat!

### TRENT "HIGH-TEMPERATURE" JACKETS

#### with TRENT "Folded-and-Formed" Heating Units

Only TRENT "Folded-and-Formed" ribbon type resistor heating element provides controlled, uniform radiant heat up to 2000°F. . . . the greatest radiating surface per square inch of element cross section of any electrical heating element! And only TRENT Heating Jackets offer these design advantages to assure efficient processing operations wherever high-temperature radiant heat with positive control is essential.



- Temperatures to 2000°F. without Pressure Equipment
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Let an experienced Trent Heating Engineer show you how Trent "High-Temperature" Jackets with Trent "Folded-and-Formed" Heating Units can mean trouble-free controlled heat for the kettles, tanks, autoclaves and similar process vessels you use or design. Or write for Bulletin 72-E.

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... for more details, circle No. 63 on Reader Service Postcard



**STRONG** enough for any shipment  
**LOW** enough in Cost to discard after use  
**LIGHT** enough to cut shipping costs

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### EVJU PRODUCTS COMPANY

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... for more details, circle No. 64 on Reader Service Postcard

## SELFWRITING DOCUMENTS

... for expediting plant operations

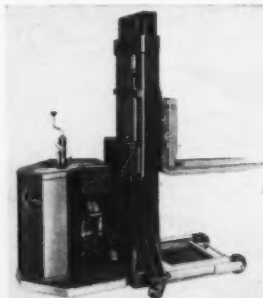


Embossed, selfwriting metal identification documents, color-coded for direction of various production actions, form the basis of this system to expedite and integrate plant operations. System includes a simple mechanical method for transcribing embossed data to forms involved. Attached by wire, the metal tags identify and classify materials, tools, and parts to control issuance, direct movement, and define work operations. Called Dashaplates, the tags are of a metal alloy resistant to corrosion and various chemicals commonly used. Embossed data can be transcribed by a stroke of a portable automatic wiring tool called the Datewriter. *Dashew Business Machines, Inc.*

... for more details, circle No. 264 on postcard

## HIGH-TIERING TRUCK

... operates in 6-ft. aisles

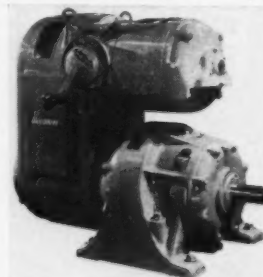


This straight engine powered high tiering truck is designed to operate in aisles as narrow as 6 ft. and is available in capacities up to 4,000 lb. The handler-stacker transmits the engine power for lifting and traveling with an all hydraulic drive, controlled by a single lever. The flow of oil to a hydraulic motor powering the drive wheel eliminates the usual clutch, transmission, and friction-type brake. An L-P Gas system is optional to minimize fumes from the 18-cu. in. engine. Lifting heights up to 15 ft. are available. *Colson Corp.*

... for more details, circle No. 265 on postcard

## VARIABLE SPEED MOTOR

... for low-speed applications

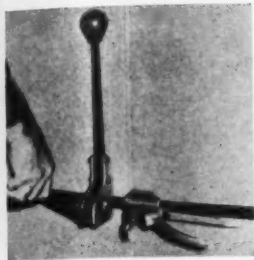


A variable speed, internally geared Varidrive motor, with take-off shaft and motor on the same side, has been designed for low-speed applications requiring variable speed, where weight distribution and limited space are important factors. Available in two types, upright and horizontal, the unit may be had with either dripproof, totally-enclosed, or explosion-proof motors. Motors, with horsepower up to 5, are compact, provide slow speeds and high torque without resorting to the use of separate gear boxes, speed changers, extra couplings, or guards. Mechanical and electrical remote controls and Varitrol automatic controls are available. *U. S. Electric Motors, Inc.*

... for more details, circle No. 266 on postcard

## STRAPPING SEALER

### ... of multi-cut pump type



This pump-type, multi-cut strapping sealer provides fast and easy operation where strapping is applied in close proximity to conveyor top or floor, according to the manufacturer. Bottom handle rests against the object being strapped, such as pallets, containers, and skids, and

sealing action is obtained by movement of the top handle supplying a multi-cut joint. All models operate at 90 deg. to the strap, and each is adaptable for all gages of tensional strapping. *Brainard Steel Division, Sharon Steel Corp.*

... for more details, circle No. 267 on postcard

## STEPLESS CONTROL

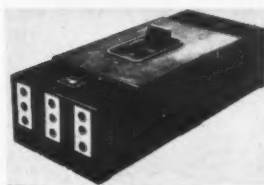
### ... for overhead traveling cranes

Stepless control for overhead electric traveling cranes reduces the number of mechanical contactors required, thus eliminating a major source of maintenance required in crane electrical equipment. Based on the principle of electronics, the control scheme uses gas-filled tubes in the control circuit. Stepless control provides many speed variations, allowing control and precision spotting in both lowering and hoisting directions under all conditions from no load to full load. Control also provides complete plugging protection so that motors may be reversed from full position in one direction to full position in the other direction without danger of damage. *Harnischfeger Corp.*

... for more details, circle No. 268 on postcard

## CIRCUIT BREAKER

### ... extends molded case breaker range



An 800-ampere M-frame circuit breaker extends the operating range of molded case breakers from 600 to 800 amperes, providing the higher continuous current rating which has formerly required larger equipment.

The 800-ampere breaker can be used with panelboards, power panels, switchboards, motor controls, bus duct plugs, and individual enclosures. The breaker offers optional pressure connectors for either double or triple cable connections per phase within the circuit breaker case. Three-inch pole-center design dimensions permit accessibility for front cable or rear bus and stud connections. *I-T-E Circuit Breaker Co.*

... for more details, circle No. 269 on postcard

## GAS-OIL BURNERS

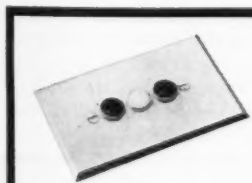
### ... with integral air register

An integral air register which reduces installation time is a feature on the models in this new line of combination gas-oil burners for industrial applications. Burner section and air register are shipped as separate units but may be quickly and easily bolted together on the job. Oil burner is a rotary cup burner designed to fire with No. 6 or lighter oil; ratings run from 9 to 125-gal. per hour. Ring-type gas burner may be used with either natural or manufactured gas and has capacities ranging from 1,650,000 to 18,750,000 Btu input per hr. *Iron Fireman Manufacturing Co.*

... for more details, circle No. 270 on postcard

Signals you can hear... Signals you can see...

# CHECK THESE TELEPHONE SIGNALS FOR ALL-AROUND EFFICIENCY!



EXECUTIVE OFFICE—  
3-light signal



SECRETARY'S DESK—  
4-light signal



RECEPTION ROOM—  
3-lamp signal



LOBBY—musical chime



STOCK ROOM—loud bell



LOUDEST SIGNAL—  
18" horn

Light-up signals that tell you at a glance which phone is ringing and what phones are in use... special bells that sound off anywhere in your plant... a musical tone for a restful lobby—the right telephone signal in the right place can cut delays, reduce strain, improve efficiency all around you! Find out all about low-cost telephone signalling for your plant or office. Just call your telephone business office.



**Pacific Telephone**

... for more details, circle No. 65 on Reader Service Postcard





## Push Carts

*balance the load*

**For faster,  
easier  
handling**

**MORE LOAD  
LESS EFFORT  
MANY USES**



"Muscle-matched" Gar-Bro push carts haul 30% more load with half the effort because they are balanced—and lighter at the handle—when fully loaded. Weigh nearly a third less than ordinary carts, with no sacrifice of strength.

Designed to handle castings, sand, ashes, chemicals, rubbish and many other bulk materials.

Two widths: 30" with 6 cu. ft. capacity; 35" with 8 cu. ft. capacity. Wheels have steel spokes, depressed hubs, 4" roller bearings. Heavyduty 4.00 x 18" 4-ply pneumatic tires. Rocker dump type carts and rocker attachments also available.

Write for catalog and further information.

**Gar-Bro Manufacturing Co.**

2415 E. WASHINGTON BLVD. • LOS ANGELES 21, CALIF.

... for more details, circle No. 66 on Reader Service Postcard

**"TOP"  
PERFORMANCE  
in  
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Small Parts!**



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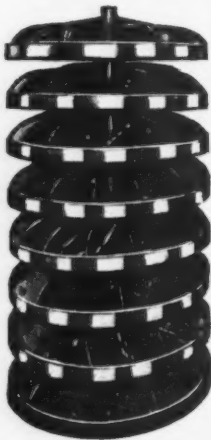
The perfect answer for the always-visible storage of small to medium items. Discs revolve both ways independently, (on ball bearings) each disc has 5 compartments with removable bin fronts and boltless adjustable subdividers. Everything always handy for quick storage and easy issuing.

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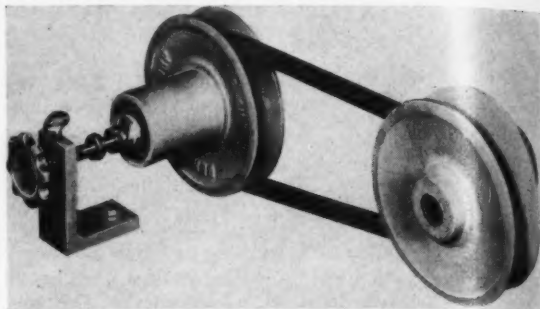
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... for more details, circle No. 67 on Reader Service Postcard

## FIXED CENTER DRIVES

... use A and B section V-belts

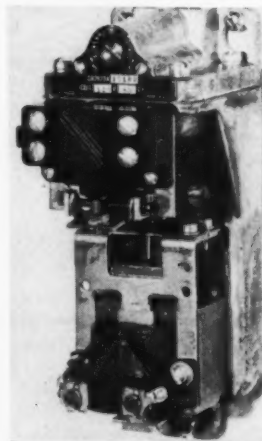


These variable pitch motor pulleys in 3 $\frac{5}{8}$ , 4, 5, and 5 $\frac{3}{4}$ -in. diameter with ratings from 1/3 to 1 hp. are for use with A and B section V-belts and come in various combinations of fixed-center drives providing speed variations up to 7 $\frac{1}{2}$ :1 ratio. The fixed-center drive consists of two pulleys, one mechanically operated and one spring loaded. Pulley discs are made of non-serrated, non-interlocking machined cast iron for longer belt life. Oil impregnated bearings on the pulley shaft eliminate the necessity of lubricating. *Gerbing Manufacturing Corp.*

... for more details, circle No. 271 on postcard

## PNEUMATIC TIMER

... for automatic control circuits



Designed for heavy-duty applications, this pneumatic timer for use in automatic control circuits has a time delay of 1/5 to 180 sec. with an accuracy of plus or minus 10% of the setting. Cast frame rigid construction resists shock and vibration and provides a stable timing element and housing. All wiring terminals are accessible from the front of the unit and are mounted on plastic supports. Operation of the timer can be changed from on-delay to off-delay with a screwdriver. *General Electric Co.*

... for more details, circle No. 272 on postcard

## FORK TRUCK

... for use with low headroom

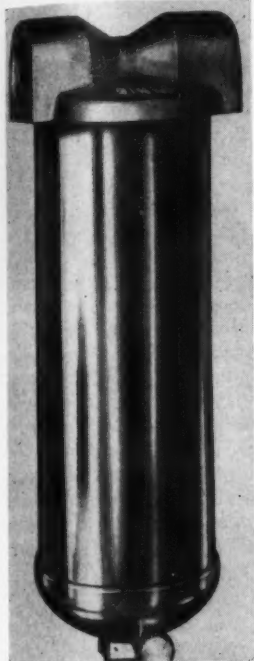


Designed especially for use where low headroom is a problem, the Safe-Hite series of fork trucks have a battery compartment reduced in height so that the operator, whose seat is on this compartment, sits 18 in. lower than on conventional models. With capacities of 2,000, 3,000, and 4,000 lb., the electric trucks also have a caster trail axle design which makes possible a high degree of truck maneuverability without loss of physical strength. *Elwell-Parker Electric Co.*

... for more details, circle No. 273 on postcard

## EXTRACTORS

... for lines with high oil, water



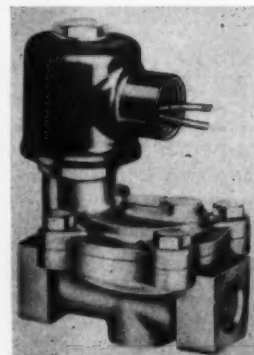
Oil and water extractors with an air capacity of 100 cfm. are well suited for lines where the amount of oil and water is excessively high. The extractor supplies dry regulated air to as many as six heavy-duty spray guns at a time. A combination of spiral baffles with absorbent filters in each of the extractors removes moisture, oil, rust, dirt, and other foreign matter from the air before it reaches the spray gun. An automatic drain opens when the air supply is shut off and closes when it is turned on again.

*Binks Manufacturing Co.*

... for more details circle  
No. 274 on postcard

## SOLENOID VALVE

... with diaphragm action, full-flow ports



This diaphragm-type solenoid valve was designed to meet the need for an off-the-shelf multi-purpose valve. Because of its diaphragm action and full-flow ports, the valve is capable of handling large capacities with a minimum pressure drop, and is suitable for shutoff control of a large variety of liquids and gases over a wide range of operating pressures up to 250 psi. Of multipurposed design, the

valve may be operated in any position and used with side and inverted mountings. Valves are normally closed and have forged brass bodies, packless construction, and bubble-tight shutoff. *General Controls Co.*

... for more details, circle No. 275 on postcard

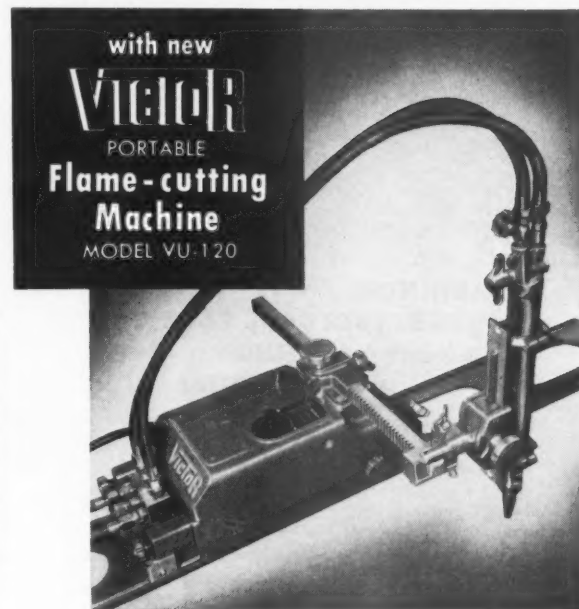
## MOTOR CONTROL CENTERS

... designed to save maximum space

This line of 7 in. high motor control centers has been designed for use where a large number of motors with ratings up to 5 hp. must be protected and controlled and floor space is at a premium. They permit ten-high mounting arrangement in a standard 90 in. high section. Up to 20 NEMA size No. 1 starters can be plugged into a standard 90 in. high back-to-back section. Units are supplied with NEMA Class A, B, or C wiring. The 7-in. units may be mounted with 14-in. and larger modules for flexible section arrangements for motor controls ranging from fractional to 100 hp. *Federal Pacific Electric Co.*

... for more details, circle No. 276 on postcard

**NOW, Speeds from 0 to 180" per minute**



Model VU-120 weighs only 35 lbs. Main wheels run on ball bearings; casters swivel on ball bearings, run on oilite bearings, are shrouded as protection against slag.

**Operates at same speeds forward or reverse.**

**Cuts straight lines, circles, square or bevel kerfs.**

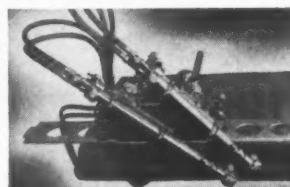
**Adaptable to many automatic welding applications.**

Now constant running motor and 3-position torque-converter transmission of new Model VU-120 bring you speeds from 0 to 180" per minute—forward and reverse—without loss of power at low speeds. In neutral position, machine free wheels so you can set up easily and quickly. Wide speed range enables you to adapt travel carriage to many automatic welding applications, using either submerged or inert arc.

You get remarkable accuracy from the Model VU-120. Floating rear caster practically eliminates side tilt and wobble. There's no "creeping"—shut off machine and it stops instantly.

Universal torch holder accommodates any model VICTOR machine cutting torch, with or without gear rack. Two torch holders can be used if desired. Case is pre-drilled for extra torch holder, side guide roller, or counterweight.

Try the fast-operating VU-120. Ask your VICTOR dealer for a demonstration on your job NOW... or write us for descriptive Bulletin 353.



Torches on Model VU-120 easily angled for bevel cuts. Machine accommodates both 2 or 3-hose torches, and in certain set-ups each holder can handle multiple torches.

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## TANDEM PUMPS

... for heavy-duty mobile equipment

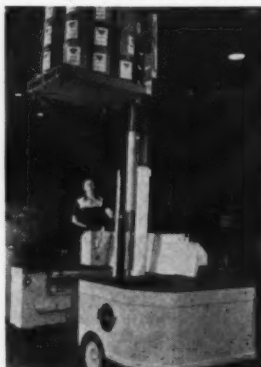


These heavy-duty gear-type hydraulic pumps were designed especially for applications on heavy-duty mobile equipment. Series 3000-2000 is a tandem pump for applications where two separate hydraulic circuits are required. The larger of the two pumps operates at pressures up to 1,000 psi. at 1,200 rpm. and delivers 36 to 64 gpm. to provide the main hydraulic power source. The smaller pump delivers 10 to 25 gpm. and may be used for auxiliary circuits such as power steering. An important feature is the pressure-balanced wear plate; by balancing pressure on the front and back of the wear plates, a fixed clearance is maintained between the wear plates and the gear faces regardless of pressure. *New York Air Brake Co.*

... for more details, circle No. 277 on postcard

## HEAVY-DUTY FORK

... operates in aisles of 6 ft.



This heavy-duty fork lift truck can carry and stack in aisles as narrow as 6 ft. The battery-powered Traveler is built on the side-loading principle, so that it doesn't have to turn to face its load. Thus the required aisle width is fixed by the width, not the length, of truck and load. With a capacity of 4,000 lb., the Model TE-4 is of the standup rider type, has full sized wheels, automotive-type steering, and hydraulic brakes. Maximum lift is 130 in. at 31-fpm. loaded lift speed. *Baker-Raulang Co.*

... for more details, circle No. 278 on postcard

## BELT FASTENERS

... for splicing conveyor belt



Speed is the main advantage of these belt fasteners for splicing conveyor belts, according to the manufacturer. Templates eliminate the inconvenience of inserting fasteners from the pulley side of belts, and a new boring bit and alloy steel wrench have been designed for use in standard electric or air impact tools. Tests made in the field by the manufacturer showed that a two-man team could apply fasteners on a 30-in. wide joint in from 15 to 20 min. with this method. *Flexible Steel Lacing Co.*

... for more details, circle No. 279 on postcard



## LIFT TRUCKS

... with trunnion steer wheels



A new series of lift trucks with 3,000, 4,000, and 5,000-lb. capacity models on pneumatic tires are gasoline-powered and reflect current automotive trends, such as a silhouette that is close to the ground and automobile-like controls. Trunnion steer wheels, short overall length, and a

short turning radius are other features of the new trucks. Brakes are self-energizing in both directions with a total of 125 sq. in. of braking area. The two smaller models have a load lifting speed of 50 fpm., while the larger model has a speed of 48 fpm. Fast forward travel speed for all models is 13.8 mph. *Hyster Co.*

... for more details, circle No. 280 on postcard

## TRANSFORMER LINE

... with 28 standard sizes



These single-phase power and lighting transformers are available in 28 standard sizes from 50 va. to 400 kva. These transformers have dual primary and dual secondary windings, and can also be used for 240 v., three-wire services. They are designed for optimum copper to core loss ratio. Core and coil are protected by a ventilated steel case, while coils are vacuum im-

pregnated with a polymerizing varnish and are blocked to withstand internal stress. *Hevi Duty Electric Co.*

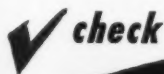
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## FILTERS

... for grinding machine coolants

Six filters with capacities of from 5 to 60 gal. per min. have been developed for filtering heavily contaminated grinding machine coolants. The accordion pleated, plastic impregnated filter elements trap particles down to a size of 10 microns. Capable of removing either ferrous or non-ferrous metal particles, the filters are easily replaceable and will handle either water soluble oils or thread grinding compounds. *Purolator Products, Inc.*

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WESTERN INDUSTRY — August 1956

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838 fluorescent lamps, each 96" long, provide the light source for this luminous ceiling at Beckman Instruments Inc., Berkeley Division

## New 'OPEN SKY' lighting boosts production 20%

Engineers work virtually 'under the open sky' at the Beckman Instruments plant, Richmond, California. A remarkable, new luminous ceiling is the reason. Planned by P. G. and E.'s lighting engineers, the luminous ceiling floods 13,000 square feet of engineering space with clear, diffused light—measuring 175 foot-candles at any point. There's no glare—and not a shadow in sight!

Results? Let Beckman's Berkeley manager Tom Allinson tell the story: "Production efficiency is up 20%. Inspection costs are down 30%. And employee morale is high. Naturally, we're thoroughly sold on good lighting!"

Assembly, fabrication and inspection areas have also been re-lighted, giving the Richmond plant perhaps the finest lighting on the West Coast.

*Improved lighting can pay off for you, too. And, since the services of P. G. and E.'s lighting engineers are free, why not ask them to make an on-the-spot check of your lighting soon?*

**P·G·and·E·**

*Pacific Gas and Electric Company*

Ask your contractor about Certified Lighting

... for more details, circle No. 74 on Reader Service Postcard

**WESTERN INDUSTRY — August 1956**

# THE INDUSTRIAL WEST ON ITS WAY

plants • production • distribution • personnel



**FIRST ELECTRIFIED ROCK-AND-ORE TRUCK** to be manufactured in the United States, this Kenworth 802-E is powered by traction motors receiving current from overhead trolleys at Riverside Cement Co.'s limestone recovery operation in Crestmore, Calif. For off-the-trolley operation, a cable reel is mounted under hood. Mine safety and ventilation were requirements that led General Electric and Riverside Cement engineers to the electrification design.

# GUIDELINES

- **HARVEY ALUMINUM RESUMES CONSTRUCTION on Oregon reduction plant** but the 54,000-ton capacity plant, on which work was halted in early stages four years ago at The Dalles, Ore., is only a Harvey starter: Future planning calls for 1957 completion of the reduction plant, a **13,000-ton expansion** late in 1958, a **second complete reduction plant** (capacity of 67,000 tons per year) in the 1960-63 stretch, topped off with a **130,000-ton alumina plant** sometime during the same period. Resume-construction orders were a result of a \$44,000,000 loan from private funds; \$2,000,000 goes to Bonneville Power Administration for transmission lines to get power into plant.

**Vital statistics:** Completion of the reduction plant will make Harvey the fifth producer of primary aluminum and operators of the first fully integrated aluminum facility in the Northwest.

- **NEW TAP ON N. MEX. RESOURCES:** Dewey Portland Cement Co., Kansas City, Mo., is planner of New Mexico's second cement plant. (Permanente announced Scholle, N. Mex., \$10,000,000 plant plans late in June.) Dewey Portland plans call for another **\$10,000,000 plant in Placitas**. Still won't produce much over N. Mex. cement requirements: Reported annual cement consumption is 2,000,000 bbl. Permanente mill will have capacity of 1,400,000 bbl.; Dewey Portland forecasts a little lower at 1,250,000 bbl., leaving only 650,000 bbl. with which to enter Texas Panhandle and northern Arizona markets: Looks like expansion's ahead here, too.

**Another reply to the more-cement cry** comes from Calaveras Cement: Production capacity was boosted by 1,000,000 bbl. June 13 when giant new fifth kiln was fired up at San Andreas, California plant.

- **JET TRANSPORTATION IS TWO STEPS CLOSER** to commercial reality: Boeing Airplane pushed its last propeller-driven plane off its Seattle, Wash., production line and swung into all-jet operation in late July. Rohr Aircraft announced plans almost simultaneously to build \$500,000 assembly plant in nearby Auburn, Wash., for production of jet power pods for Boeing's 707 Stratocruiser and KC-135 Stratotanker.
- **TWO WESTERN PULP MILLS PLANNED in spite of over-production debate** that is reportedly going on within the paper and paperboard industry. (\$2,000,000,000 industry-wide expansion scheduled to take place by 1959 adds up to over-production, say some members of the industry!) Fibreboard Products joins Simpson Lumber in joint venture on **\$35,000,000 300-ton capacity mill** at Eureka, Calif., and Crown Zellerbach is studying possibility of building a **400-ton per day mill** at Astoria, Ore.
- **MORE PEOPLE MEANS MORE SEWER PIPE MEANS CLAY PROSPECTING MEANS \$5,000,000 PLANT:** Gladding, McBean & Co. will build a plant near Corona, Calif., and the site of its own private "gold mine" (a 100-year supply of high quality Bedford clay located after 10 years of prospecting) for the manufacture of vitrified clay pipe—for industrial, municipal and home sewer systems—and other clay products.

**Industrial fire brick prices will go down** in the Northwest as a result of another Gladding, McBean enterprise: A new \$1,300,000 plant will manufacture **high-grade fire brick for the first time** in eastern Washington at Mica. Natural gas—needed to fire process kilns—entering the Northwest played a major role in making it possible and perhaps helped create a higher demand for the refractories by attracting new "furnace" industries to the Northwest.

News details on following pages

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ATLAS MISSILES will be built in \$40,000,000 plant planned by Convair-Astronautics.

## Convair details Astronautics plant

A \$40,000,000 research, development, manufacturing, and preliminary testing facility for the Atlas intercontinental ballistic missile will be built at Montgomery Field in San Diego by the Convair Division of General Dynamics Corp. The new plant will be known as Convair-Astronautics.

Construction of the plant will begin this summer and is scheduled for completion in 1957. Cost of the land,

buildings, and part of the equipment will be borne by Convair, while special equipment will be Air Force financed.

According to J. R. Dempsey, director of the Atlas program, astronautics was chosen as the name for the firm because it is the most representative of the future products on which the organization is working. Astronautics is the science that treats with the possibility of interplanetary space travel.

## \$4,000,000 plant underway for Marchant

Construction will start this month on the future world headquarters and main factory of Marchant Calculators, Inc., in Oakland, Calif. Reportedly, the 4,000,000 plant, which will contain 12 acres under one roof, will be one of the nation's largest light manufacturing establishments. To be located on property adjacent to Marchant's present assembly facilities and near the company's group of production plant and offices on the north side of Oakland, executive, administrative, patent, sales, service, engineering and research offices will be located in a

four-story front section of the new building. The factory section will be a continuous 800-ft. long two-story structure with a sub-floor under most of the building. Manufacturing operations will be performed on the first floor. Assembly, testing and inspection facilities will be housed on the second floor. Sub-floor area will be devoted to maintenance and stores departments.

Construction schedule calls for progressive occupancy of the new facility with the first moves scheduled for mid-summer of 1957.

## Narmco expanding facilities for Multiwave pilot plant

Narmco Metlbond Co. is expanding its facilities for the pilot plant production of Multiwave, a recently developed flexible sandwich core material. The pilot plant should be in operation by November 1, according to the company.

Addition of the new production facilities is the first step in the firm's program to expand the output of the aircraft structural material. The fabrication facilities will initially house two automatic core-producing machines, and future plans call for three more machines to produce Multiwave.

## On Mark Engineering builds San Fernando Valley plant

Construction has started on a \$1,000,000 plant for On Mark Engineering Co., Glendale, Calif., on a 12-acre site at the San Fernando Valley Airport in Van Nuys, Calif. The firm expects to occupy the new facilities about the first of November.

About \$500,000 will be invested this year in erecting 35,000 sq. ft. of hangar, warehouse, shop, and office space and in the construction of parking areas and an aircraft wash rack. An additional \$500,000 will go for further improvements in the succeeding 24 mo.

## Harvey sets dates on aluminum plant

Harvey Aluminum of Torrance, Calif., has completed financial and contractual arrangements for construction of its 54,000-ton aluminum reduction plant at The Dalles, Ore. Work at the 500-acre site should be completed late in 1957.

Power for the reduction plant will come from the Bonneville Power Administration. Harvey will put up more than \$2,000,000 for transmission facilities to bring power to the plant from the Big Eddy Switching Station.

Harvey will increase capacity of the plant by 13,000 tons in late 1958. A long term program calls for construction of a 130,000-ton alumina plant and a second reduction plant of 67,000 tons annual capacity during 1960-1963.

## G-E plans Lamp Div. warehouse in L.A.

General Electric Co. will construct a \$2,000,000 lamp division warehouse, distribution, and office center in the Vail Field area of Los Angeles. The 117,300-sq. ft. single story, reinforced concrete structure should be completed and occupied by January 1957.

The new General Electric center will serve the Southern California, Arizona, and Southern Nevada areas and will employ approximately 100 people initially. In addition to warehouse and distribution facilities, the structure will house the regional sales headquarters of the large, miniature, and photo lamp departments.

## Cullman Wheel opens Los Angeles warehouse

Cullman Wheel Co. has opened a warehouse in Los Angeles to carry its line of Grip-Master and stock sprockets, along with roller chains, conveyor chains, and flexible couplings. Cullman has headquarters in Chicago.

## Textron division to build second Coquille plant

The Coquille Plywood Division of Textron, Inc., plans to build a second plywood plant at Coquille, Ore., to cost \$2,000,000. It will be located adjacent to the firm's present facilities

and is scheduled for completion in about 6 mo.

The plant, located on 14 acres, will house a complete plywood operation and provide work for some 200 men. It will add about 8,000,000 sq. ft. of plywood monthly to the firm's present production of 10,000,000 sq. ft.

### California Packing acquires site for multiproduct plant

California Packing Corp. has acquired a 130-acre site on the outskirts of Stockton, Calif., on which it expects to build a multiproduct canning plant. Construction should start this fall and the first unit should be in operation during the 1957 canning season.

When completed the plant will have individual units for packing tomatoes and tomato products, asparagus, peaches, figs, and other products. A single story masonry structure, the plant will have more than 18 acres of floor space and should employ during peak season about 1,500 people.

## \$7,500,000 for first Western Airco plant

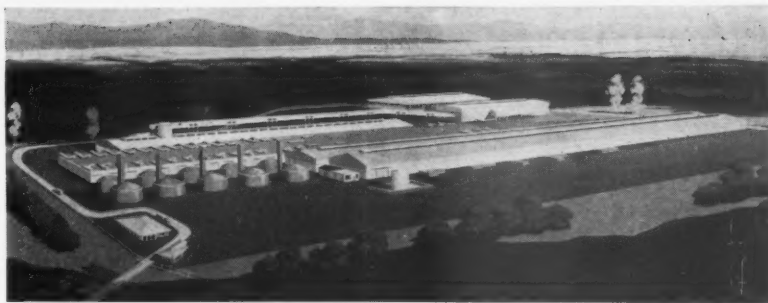
Air Reduction Pacific Co. will build a new air liquefaction plant in the Los Angeles area to produce 55 tons of high purity liquid oxygen daily, as well as 15 tons of liquid nitrogen, and 3½ tons of liquid argon. Cost of the plant will be about \$7,500,000.

The plant, which is scheduled for completion during the second half of 1957, will supply California, New Mexico, and Arizona industrial areas. It will be the fourth air liquefaction plant for Air Reduction, which operates three other plants in the East. The Los Angeles plant will be under the supervision of E. W. MacCorkle.

### Cutter Laboratories acquires Geo. A. Coleman Co. stock

Cutter Laboratories, Berkeley, Calif., has completed arrangements to acquire all the outstanding common stock of the Geo. A. Coleman Co., Inc., owners of Pacific Plastic Products of San Francisco. This acquisition will mark Cutter's second entry into the plastics field in less than a year. It recently acquired Plastron Specialties, Inc., in Los Angeles.

Pacific Plastic Products will operate as a wholly owned Cutter subsidiary, with Robert Greenhood as president.



VITRIFIED CLAY PIPE will be produced by Gladding, McBean in new \$5,000,000 plant.

## 33-structure plant for Gladding, McBean

Immediate construction of a \$5,000,000 plant for the manufacture of vitrified clay pipe has been announced by Gladding, McBean & Co., Los Angeles. The firm plans a total of 33 structures with 200,000 sq. ft. of space.

Site of the new plant is near Corona, Calif., where the firm has discovered

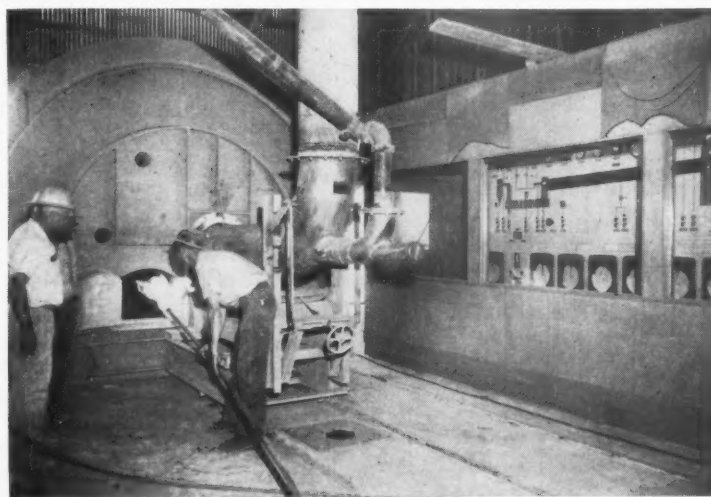
over 1,000,000 tons of high grade sewer pipe clay in Bedford Canyon. Initial capacity of the plant will be 6,000 tons a month; the firm expects to produce 12,000 tons a month in about three years. The new plant will house a 600-ft. tunnel kiln and 10 periodic or "bee-hive" kilns.

### Rucker to distribute Hannifin Corp. line

The Rucker Co. of Oakland and South Gate, Calif., has been appointed a California distributor for Hannifin Corp.'s line of filters, regulators, and lubricators for use in compressed air lines. Hannifin has headquarters in Des Plaines, Ill.

### Isotope Products opens Los Angeles sales office

Isotope Products, Inc., manufacturer of industrial instrumentation, has opened a sales office in Los Angeles to provide better service to industry on the West Coast. David Kneeland will be in charge of the office.



STARTING THE FLAME on Calaveras Cement's new kiln is burner Howard Little.

## Calaveras boosts production with new fifth kiln

Annual production capacity at Calaveras Cement Co.'s San Andreas, Calif., plant has been boosted by 1,000,000 bbl. as a result of installation of a giant fifth kiln. The kiln's flame, shown

being initially started by Howard Little, at right, will maintain working temperatures of 2,800-deg. F. Control board for push-button regulation of the kiln is shown at the extreme right.

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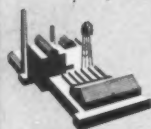


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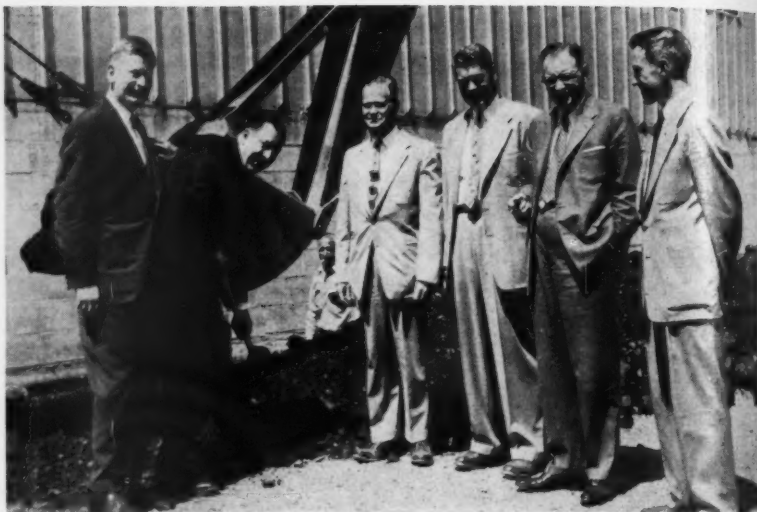
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**NEW SPOKANE BUILDING** is underway for Joseph T. Ryerson & Son, Inc. On hand at the ground breaking were (left to right): **Raymond N. Carlen**, vice president in charge of operations, **Roy M. Bialkowsky**, plant manager, **George W. Porter**, manager, reinforcing products department, **Marion W. Dudek**, plant superintendent, **James M. Mead**, vice president in charge of procurement, and **William N. Larson**, office and credit manager.

## Ryerson constructing offices at Spokane service plant

Joseph T. Ryerson & Sons, Inc., is constructing a new office building at its Spokane, Wash., service plant. The new steel and brick structure, to contain about 4,500 sq. ft. of space, should

be completed about the first of September.

Former office space will be converted to warehouse space, increasing plant capacity. The plant was substantially enlarged in 1953 also when 10,000 sq. ft. of space was added for new reinforcing steel division.

## General Petroleum plans \$6,500,000 NW expansion

General Petroleum Corp. has announced a \$6,500,000 expansion for its refinery at Ferndale, Wash., which will include three projects scheduled for completion by September of 1957.

Major part of the expansion will be devoted to the construction of a second Sovafomer, which will treat a maximum of 9,000 bbl. daily of straight run gasoline by a high temperature-pressure process.

## Shell expansion scheduled for fall completion

Expansion work on Shell Chemical Corp.'s synthetic rubber plant in Torrance, Calif., is scheduled for fall completion. The work includes installation of a new unit to produce a special latex for the manufacture of foam rubber products, extensions to the butadiene facilities, and modernization of the synthetic rubber unit.

When modernization is completed, the synthetic rubber unit will be able to make 110,000 long tons of a broad range of rubber types a year, as compared to its original capacity of 89,000 tons of a more restricted range. Butadiene production will also be increased.

## 2nd big cement plant for New Mexico

Placitas, N. Mex., has been chosen as the site for a \$10,000,000 plant for Dewey Portland Cement Co. of Kansas City. Placitas is about 17 mi. north of Albuquerque.

Capacity of the Dewey plant will be 1,250,000 bbl. of cement a year, which will bring the firm's total annual output to 7,000,000 bbl.

## P & C Hand to build \$81,000 plant addition

P & C Hand Forged Tool Co. is building a one-story concrete addition to its plant in Milwaukie, Ore. The addition, to cost about \$81,000, will add 18,000 sq. ft. of space to the plant.

## California Vegetable to build on Modesto industrial tract

California Vegetable Concentrates, Inc., of Modesto, Calif., has announced plans to build a new plant on the Tidewater Southern Modesto industrial tract.

California Vegetable will build a 50,000-sq. ft. building with concrete slab tilt up construction on 10 acres of the tract. The firm plans to start production there by January 1, 1957.



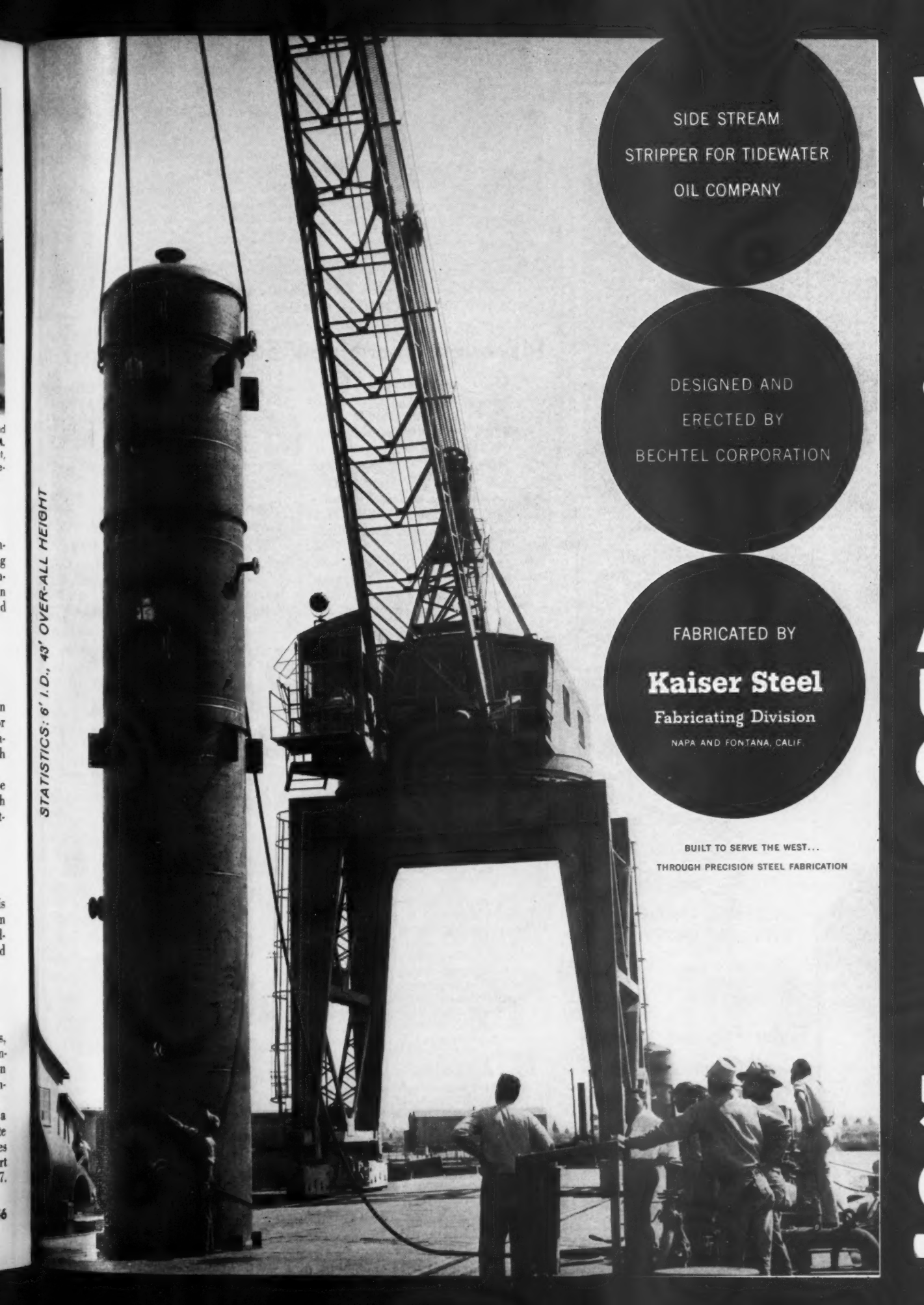
STATISTICS: 6' I.D., 43' OVER-ALL HEIGHT

SIDE STREAM  
STRIPPER FOR TIDEWATER  
OIL COMPANY

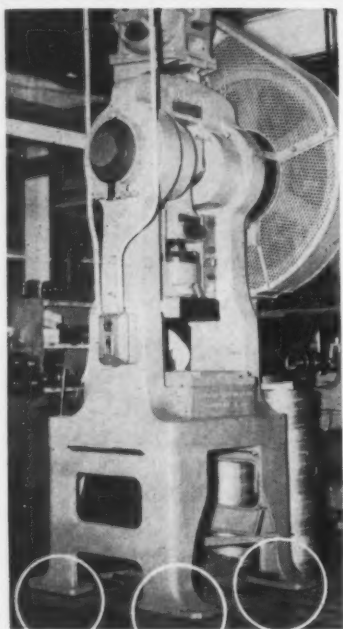
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**UNISORB?**

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**Reduces vibration as much as 85%!**

**Installation costs lowered about 30%!**

**AND THAT'S NOT ALL!**

More quiet operation of machines improves workers morale — lowers occupation fatigue — reduces rejects on production machines — prolongs life of machinery and buildings!

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Los Angeles 14  
Michigan 8631

... for more details, circle No. 78



**LARGEST OF ITS KIND** in the world, new Los Angeles PIE terminal includes 705-ft. dock.

**PIE opens giant new So. Calif. terminal**

A 35-acre project located in the central manufacturing district of Los Angeles, Pacific Intermountain Express's new Southern California terminal, is said to be the largest of its kind in the world. PIE commenced operations in the new terminal July 23.

Included in the terminal features are shops, offices and a 705-ft. dock built to accommodate 144 trailers. The terminal dock features a Towveyor system which, via a 1/4-mi. endless chain, hauls rubber-tired carts loaded with freight to various distribution loading areas. Intercoms and

pneumatic message systems increase the efficiency of the operation by providing instantaneous transmission of verbal or written message between offices and all sections of the dock. The new terminal employs 700 persons.

**Sherwin-Williams opens  
San Leandro plant**

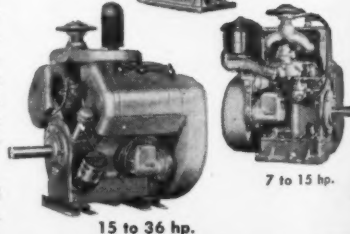
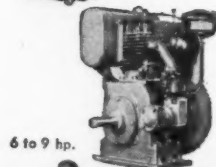
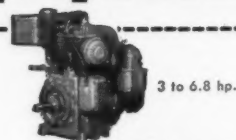
Sherwin-Williams Co. has held an open house and reception marking the official opening of its new container plant in San Leandro, Calif. Participating in the event were Arthur W.

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Your Equipment**

**WISCONSIN  
HEAVY-DUTY *Air-Cooled*  
ENGINES**

• The extreme compactness and relatively light weight of these engines enable the original equipment builder to develop smaller, lighter equipment to replace heavier, bulkier machines powered by more cumbersome engines . . . or to include Wisconsin Engines as power components on new equipment . . . without sacrificing heavy-duty performance and dependability. Thirteen models, (3 to 36 hp.) offer power selectivity to match your equipment.

Tell us about your power problem. Detailed "Specs" and engineering data gladly supplied.



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World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN

... for more details, circle No. 79 on Reader Service Postcard

**WESTERN INDUSTRY — August 1956**

Steudel, president, and S. B. Coolidge, vice president and director of auxiliaries, both from the firm's headquarters in Cleveland, Ohio.

Some 250 guests toured the plant which is now producing tin cans for West Coast paint manufacturers, motor oil marketers, and other industries. The new plant, which cost \$1,500,000, has a capacity of 175,000,000 cans annually.

### Calpak plans \$5,000,000 cannery in Stockton, Calif.

Start-construction date for a \$5,000,000 canning plant in Stockton, Calif., has been tentatively set at this fall with the first unit scheduled to go into operation during the 1957 canning season. Over 18 acres of floor space will be provided in the new California Packing Corp. plant which will be located on a newly acquired 130-acre industrial site. Peak employment will be at least 1,500 workers.

Operations will consist of processing peeled tomatoes, free-stone peaches, asparagus, and figs. Some other fruit products will also be canned.

### Gladding, McBean Northwest to produce high grade brick

The first high-grade fire brick for industrial furnaces will be produced at Mica in eastern Washington when Gladding, McBean & Co.'s Pacific Northwest Division begins operation of its new \$1,300,000 plant. The new plant will double the output of the present facility and will serve Washington, Idaho, Montana, and a large portion of Oregon.

Production will include super, high, intermediate, and low-duty refractories, as well as a full line of face brick and pavers. It is expected that over 14,000,000 bricks will be produced annually starting late in 1957. Facility will be under the direction of R. J. McAlpin and Del McConnell.

### Coatings & Fiberglas formed as special consulting service

L. J. Morris and F. C. Lombardo, both formerly of Amercoat Corp., have formed a specialized consulting service for paint and plastic manufacturers and users. The firm will be known as the Coatings & Fiberglas Research Co., and have offices and laboratories in Los Angeles.

Services will include counseling and formulation of industrial protective coatings and resin-impregnated Fiberglas with qualities for specific applications.

*Lighten your load*  
with **COLSON** casters!



EVERYTHING MOVES EASIER on Colson Casters. No need to hunt for special casters for your equipment, machinery or furniture. Colson has the world's largest selection — 1458 different sizes, shapes and types.

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*Colson Equipment & Supply Co.*

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36 inch by 20 foot  
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See Goodyear, too, for seaload hose, oil suction and discharge hose up to 12 inches in diameter and 50 feet in length.

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## ANSWERS TO CONVEYOR PROBLEMS

NEW, 4-page catalog tells and shows how Yuba-Schrock internal drive head pulleys save space, cut downtime, promote safety; liberally illustrated with photos of Western applications. Diagrams and charts give dimensions and speeds for sizes from 1 to 125 hp.

See for yourself how "the head pulley with the motor inside" solves conveyor problems. Write for your FREE copy of this Yuba-Schrock folder now.



## YUBA-SCHROCK

701 East H Street • Benicia, California

... for more details, circle No. 82 on Reader Service Postcard

## New pulp mill plans proposed by Crown Zellerbach

Crown Zellerbach Corp. is considering a kraft pulp and paper mill for Astoria, Ore., with a capacity of 400 tons daily. The firm has received a letter from Clatsop County Court regarding the use of timber from 140,000 acres of county-owned tax delinquent land in the area to help supply raw material.

Zellerbach owns 180,000 acres of tree farm land in the Clatsop vicinity that could be pooled with the timber under discussion to supply the mill. The firm will next ask the Oregon Board of Forestry for rights to cut timber on a sustained yield basis from the public land.

## \$1,000,000 furniture plant planned for So. California

International Furniture, a Chicago, Ill.-homed firm, broke ground recently for a new \$1,000,000 plant in Corona, Calif. Covering 71,000 sq. ft. of a 31-acre site, the plant will employ about 130 production employees in the manufacture, assembly and upholstering of seating and dual-purpose living room furniture when the plant gets into operation in November of this year.

Future planning calls for doubling of the plant size and increasing production employment to between 250 and 300 persons.

## Titanium Metals opens first titanium warehouse

The first warehouse for titanium metal has been established in Los Angeles by Titanium Metals Corp. of America, and is stocked with types and sizes of metal in greatest demand by West Coast airframe and missile fabricators.

The firm recently expanded its mill processing facilities and purchased a specially designed \$3,000,000 Sendzimir mill for precision rolling of wide sheet.

## Standard Oil plans \$1,000,000 expansion in Idaho

The Boise, Ida., terminus of the Salt Lake Pipe Line Co. will be expanded to increase tankage capacity by 370,000 barrels at a cost of about \$1,000,000 by Standard Oil Company of California. Completion of the expansion will speed movement of products through the twin-line section from Salt Lake to Boise. Expansion will also increase the capacity of the Spokane lines.

Storage capacity at the Pasco, Wash., terminal of the Salt Lake pipe line will also be increased by plans for construction of three 45,300-bbl. tanks and one 35,810-bbl. tank, expanding the terminal's capacity to 610,000 bbls.

Under consideration is a \$500,000 boost for the Rangely, Colo.-Salt Lake crude oil line through installation of additional booster pumps.

### Rohr will build assembly plant in Washington

A \$500,000 assembly plant will be built by Rohr Aircraft Corp. in Auburn, Wash., to assemble jet power pods for Boeing Airplane Co.'s KC-135 Stratotanker and 707 Strato-cruiser.

Work will start soon on the 33,000-sq. ft. building, the first unit of the new plant which will be located on a 50-acre site. Completion is scheduled for this fall. Rohr has leased another structure in the area where operations will begin as soon as equipment is installed.

### Pittsburgh Plate Glass opens Denver warehouse

A new 67,000-sq. ft. regional office and warehouse costing \$500,000 has been put into operation in Denver, Colo., by Pittsburgh Plate Glass Co. The new facility will handle the distribution of Pittsburgh Plate's paint and glass products to dealers in Colorado and parts of the surrounding states.

Heading up the Denver operation—presently employing 85 people—as general manager is T. A. Nelson. Curt Parson is manager of paint sales.

### Filon Plastics appoints two Western distributors

Record Supply Co. of Reno, Nev., and George C. Jacobs Co. of Eureka, Calif., have been appointed as new Western distributors for Filon Plastics Corp., El Segundo, Calif. Both firms will stock Filon's line of corrugated and flat Fiberglas reinforced plastic panels.

### Crucible Steel breaks ground for new Denver branch facility

A new branch office and warehouse is underway in Denver, Colo., for Crucible Steel Co. On hand at the ground breaking ceremonies were R. L. Stark, Crucible's Denver branch manager, L. R. Paist, assistant manager of the Denver branch, and construction officials of Newstrom-Davis Co., contractors on the job.

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are users of the...



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and similar products	

In the fields of industrial treating, drying, curing and baking, ROSS provides more of the required air processing equipment than any other maker of such equipment. Five modern plants geared for volume production, 13 fully staffed sales and engineering offices and one of the finest research laboratories of its kind in the world are available for ROSS service throughout the U. S. A. and Canada. More than 35 years of experience solving air processing problems add to your assurance of securing the right results from your processing operations.

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or Asphalt Coating  
in Handy Tape Form

There's no need to gamble in fighting corrosion. Since 1941, TAPECOAT has proved its ability to give lasting protection on pipe, pipe joints, couplings, conduit, cable and insulated piping—above or below ground. Its resistance to moisture, acids, alkalis, electrolysis, salt water and other severe corrosive and abrasive conditions has established TAPECOAT as the time-tested quality protection to cut maintenance and replacement costs.

TAPECOAT is made as a coal tar or an asphalt coating in handy rolls of 2", 3", 4", 6", 18" and 24" widths. It is easy to apply, using a torch to soften or bleed the pitch, and then wrapped spirally around the vulnerable surface.

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**TAPECOAT®**  
Company

Originators  
of Coal Tar and  
Asphalt Coatings  
in  
Tape Form

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Evanston, Illinois

... for more details, circle No. 84  
106

## Ryerson's Ryertex-Glyco division changes name



H. J. LeBeck

Ryerson has also appointed *Harold J. LeBeck* as assistant to the manager of the division. LeBeck has served as a sales representative for industrial plastics and bearings. He will direct the promotion and sale of plastic pipe, valves and fittings, also plastic sheets, bars, and fabrications.

The Ryertex-Glyco Division of Joseph T. Ryerson & Son, Inc., has changed its name to the Industrial Plastics and Bearings Division. According to the firm, the new name gives a clearer picture of the operations of the division.

## New No. California offices for Goodall Rubber

Offices of Goodall Rubber Co. (Calif.) have been moved to a new location at 221 E. Grand Ave. in So. San Francisco, Calif. Formerly located at 398 Fifth St. in San Fran-



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manufacturing facilities  
within easy trucking distance  
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FACTORY CARLOAD SHIPMENTS at regular intervals reduce your freight expense and provide adequate replacement of stock items.

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F. E. Bennett Company  
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Phone: CAPITOL 8-2321

SEATTLE  
Secord Sales Company  
95 Connecticut Street  
Phone: MAIN 0737

TUCSON  
L. J. Clarke & Company  
2625 N. 1st Avenue  
Phone: 4-6233

LOS ANGELES  
H. L. Stewart & Associates  
1547 Estudillo Avenue  
Phone: ANGELES 1-2194

PHOENIX  
L. J. Clarke & Company  
18 East Lincoln Street  
Phone: ALPINE 4-1754

SALT LAKE CITY  
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disco, the district office outgrew its space and moved so that a necessary 40% increase in warehouse stocks could be made.

R. W. Steinke, district manager for Goodall Rubber, heads up the new facility which provides over 10,000 sq. ft. of warehouse space and about 1,300 sq. ft. of office area.

#### Garrett division opens Denver branch office

Garrett Corp.'s Airsupply Division in Beverly Hills, Calif., has opened a branch office in Denver, Colo. Airsupply is Western sales and engineering representative of Garrett's manufacturing divisions.

The new branch will be headed by Mel Kalb, who has been transferred from Airsupply's main office. The branch will provide sales and engineering service in the Rocky Mountain area.

#### Automatic Switch appoints two Western distributors

Automatic Switch Co. of Orange, N. J., has appointed two new Western distributors for its line of general purpose solenoid valves. Hendrie & Bolt-hoff Co. of Denver, Colo., will serve the mountain area, while Hydraulic Equipment Co. of Los Angeles, Calif., will serve Southern California.

#### Fibreboard, Simpson cooperate on Eureka paperboard mill

Simpson Lumber Co. and Fibre-board Paper Products Corp. are co-operating to build jointly a pulp and paperboard mill at Eureka, Calif. Plans are now underway for a 300-ton or more capacity mill, which will cost about \$35,000,000.

## WESTERNERS AT WORK . . .

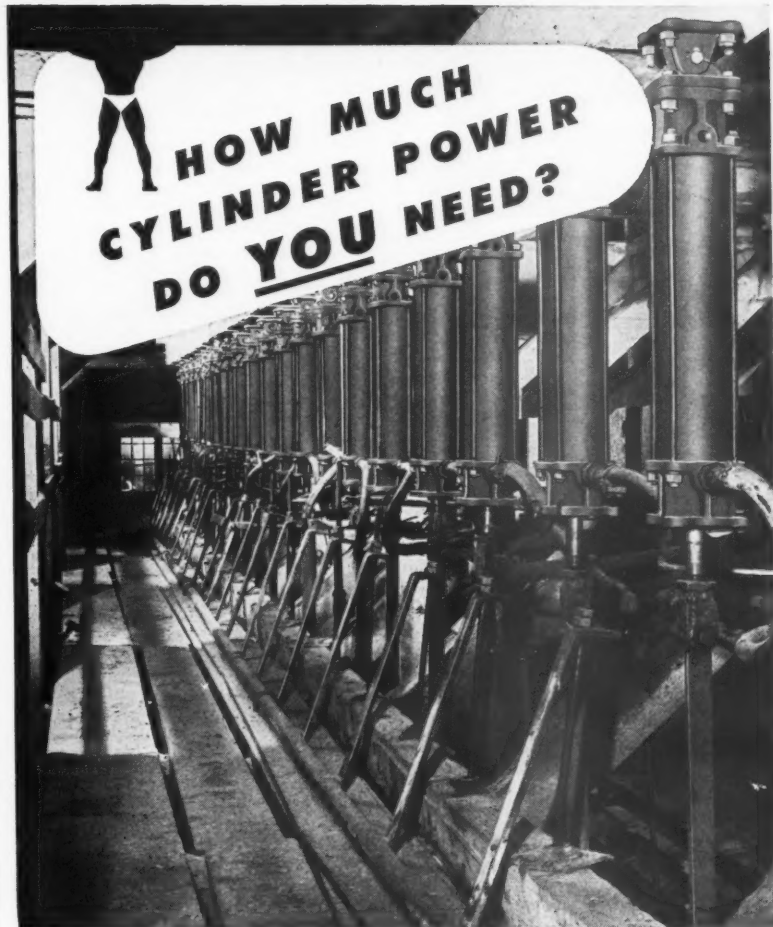
#### Yale & Towne Manufacturing Co.

... has appointed **Frank Boufford** Western regional sales manager. Formerly serving with Yale & Towne as national accounts salesman in New York, he succeeds **Garnett A. Vining**, who recently resigned from the post. Prior to joining Yale & Towne, Boufford served with The Electric Storage Battery Co.

#### Fruehauf Trailer Co.

... has made **Paul F. Woth** branch manager in Sacramento, Calif. He was previously sales representative in the Los Angeles area.

WESTERN INDUSTRY — August 1956



**HOW MUCH CYLINDER POWER DO YOU NEED?**

#### Cape Arago Lumber Co., Empire, Oregon, uses

### Ledeen CYLINDERS on gang trimmer

This battery of 4" Ledeen Cylinders has been giving dependable, trouble-free service on this gang trimmer for over 4 years. Low maintenance and long life are reasons why Ledeen Cylinders find wide acceptance and countless applications in the timber industry.

Standard cylinders available from stock in 1½" through 12" bores... Special cylinders up to 20". These cylinders offer a wide range of capacities to meet your power requirements.

**HOW MUCH CYLINDER POWER DO YOU NEED?**

Send for this cylinder capacity chart. It will help you determine the size Ledeen Cylinder you need to meet your power requirements.

VALVES • CYLINDERS  
VALVE ACTUATORS  
AIR-HYDRAULIC PUMPS  
AND BOOSTERS

Ledeen CYLINDER CAPACITIES												
CAPACITY OF CYLINDERS FOR VARIOUS PRESSURES, LBS. PER SQUARE INCH												
Bore	40	45	50	55	60	65	70	75	80	85	90	95
1½"	60	75	90	105	120	135	150	165	180	195	210	225
2"	100	125	150	175	200	225	250	275	300	325	350	375
2½"	150	187	225	262	300	337	375	412	450	487	525	562
3"	200	250	300	350	400	450	500	550	600	650	700	750
3½"	262	325	387	450	512	575	637	700	762	825	887	950
4"	325	400	475	550	625	700	775	850	925	1000	1075	1150
4½"	395	487	575	662	750	837	925	1012	1100	1187	1275	1362
5"	462	575	687	800	912	1025	1137	1250	1362	1475	1587	1700
5½"	537	662	787	912	1037	1162	1287	1412	1537	1662	1787	1912
6"	612	750	887	1025	1162	1300	1437	1575	1712	1850	1987	2125
6½"	687	837	987	1137	1287	1437	1587	1737	1887	2037	2187	2337
7"	762	925	1087	1250	1412	1575	1737	1900	2062	2225	2387	2550
7½"	837	1012	1187	1362	1537	1712	1887	2062	2237	2412	2587	2762
8"	912	1100	1287	1475	1662	1850	2037	2225	2412	2600	2787	2975
8½"	987	1187	1387	1587	1787	1987	2187	2387	2587	2787	2987	3187
9"	1062	1275	1487	1687	1887	2087	2287	2487	2687	2887	3087	3287
9½"	1137	1362	1587	1812	2037	2262	2487	2712	2937	3162	3387	3612
10"	1212	1450	1687	1925	2162	2400	2637	2875	3112	3350	3587	3825
10½"	1287	1537	1787	2037	2287	2537	2787	3037	3287	3537	3787	4037
11"	1362	1625	1887	2150	2412	2675	2937	3200	3462	3725	3987	4250
11½"	1437	1712	2000	2287	2575	2862	3150	3437	3725	4012	4300	4587
12"	1512	1800	2100	2400	2700	3000	3300	3600	3900	4200	4500	4800

Write for Bulletin 500

**Ledeen Mfg. Co.**  
1606 So. San Pedro St.  
Los Angeles 15, Cal.

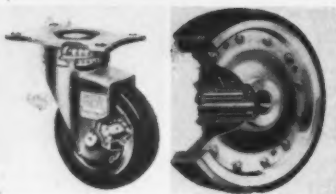
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**RUBBER TREADS** . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

**RUST-PROOFED** . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

**LUBRICATION** . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gun lubrication.

**STRING GUARDS** . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

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**Latrobe Steel Co.**

... has promoted *Philip E. Gordon* to district manager of the Los Angeles sales district. He will supervise sales efforts in California, Oregon, and Washington. He was formerly a sales representative in Detroit. Gordon succeeds *C. W. Barnhouse*, who will remain as Western sales manager.

**Sun Chemical Corp.**

... has transferred *Harry D. Kennedy* to the Los Angeles office of its subsidiary, *A. C. Horn, Inc.*, as branch manager. He will be supervising sales in Southern California for the complete line of Horn paints, building and maintenance materials, and industrial coatings. He was formerly in the Washington area.

**Jeffrey Manufacturing Co.**

... has named *William T. Davis* to the Western territory sales office as application engineer. He was formerly in the Houston office and will now headquarter in the San Francisco Bay Area. Home offices for the firm are in Columbus, Ohio.

**Buck Manufacturing Co.**



R. Swan

... has named *Robert Swan* as Western regional sales manager. He will be in charge of dealer sales in the 11 Western states for the firm's portable electro-magnetic drill presses, vises, and plate clamps. Swan has served with *Aero-Coupling Corp.* and *Hall-Scott Motors Co.*

**Westinghouse Electric Corp.**

... has appointed *William L. Trudgian* as Pacific Coast regional agency and construction manager. He succeeds *Clyde H. Wood*. Trudgian has been North Pacific district agency and construction manager in Seattle. His new headquarters will be in San Francisco. *Ray T. Killen* will succeed Trudgian in Seattle. *Robert E. Ralstin* has been appointed to the newly established position of area sales manager for apparatus in the Portland office. *Lytle Connell* will take over as superintendent of quality control at the firm's Sunnyvale, Calif., plant.

**MILLER-ROBINSON CO.**

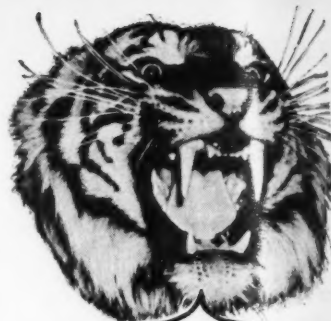
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... for more details, circle No. 91



## Jervis B. Webb Co.



J. Peters

... has appointed *Jack Peters* general manager of the Jervis B. Webb Co. of California. He succeeds *Paul Kuhn*, vice president and general manager, who is retiring. Kuhn has been with Webb for many years and will continue to serve on a consulting basis. Peters is the former sales manager for Webb of California and before that served as a sales engineer.

## Crane Co.

... has appointed *Frank R. Perry* manager of its Los Angeles branch, to succeed *Darrell R. Nordwall*, who has been transferred. Perry joined Crane in 1927 at its former Santa Barbara branch and was transferred to the Los Angeles branch in 1942.

## Rockwell Manufacturing Co.

... has made *J. A. Capasso*, formerly a salesman in the Delta Power Tool Division's Oakland, Calif., district office, sales manager for the San Diego district. He succeeds *Harold F. Martin*. His territory will include Arizona and part of Southern California.

## Union Malleable Manufacturing Co.



D. A. Kates

... has appointed *David A. Kates* as vice president in charge of the Western division. Kates has been in charge of sales and warehousing in the Western territory for the past three years. He will supervise sales and distribution of the firm's complete line of pipe fittings in 10 Western states and will direct warehousing operations in San Francisco, Denver, and Portland from his Los Angeles headquarters. He will also supervise the nipple manufacturing and warehousing facilities in Vernon, Ore.

## Allis-Chalmers Manufacturing Co.

... has named *Irwin W. Best, Jr.*, as a sales representative in the Seattle district. Best recently completed Allis-Chalmers training course for graduate engineers.

## Eastman Chemical Products, Inc.



N. C. Taylor

... has assigned to *Nelce C. Taylor* the job of full-time West Coast service engineer. He will serve the firm's plastics customers throughout the West and work from the Los Angeles office of *Wilson & Geo. Meyer & Co.*, Pacific Coast sales representative for Eastman, a subsidiary of Eastman Kodak Co. Before his West Coast assignment, Taylor was service engineer for an eastern territory.

# CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are 1/8 inch short of contracted space to allow for borders and composition. Rates are \$9.00 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

## Position Wanted

### ACTIVE ASSOCIATE

With Technical Sales experience wanted by Atomic Laboratory in Los Angeles. Modest investment. Inquiries invited from men of integrity and experience. (Atomic experience desirable but not essential—will train right man). Send detailed resume to Box No. 7-A, c/o WESTERN INDUSTRY, 609 Mission St., San Francisco 5, Calif.

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Satisfied with the present, but seeking a stronger future. Seven years administrative sales experience. Six years engineering, with a National manufacturer of logging and construction equipment. Family man, age 39. Thorough training in engineering and business administration. Anxious to shoulder some of your sales responsibilities.

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Western Industry, Box 8-A  
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## For Sale

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Practically new 200KW steam turbine generator, used as standby machine in food processing plant in Memphis, Tenn., for last ten years, cost new then more than \$13,000; can be converted from DC to AC for \$5,135. Today's price new approx. \$18,000. Offered subject to prior sale for immediate delivery, f.o.b. Memphis, complete, at only \$7,500. Might take less for "quick sale." Dealers invited. Details by writing Box 8-A, Western Industry, 609 Mission St., San Francisco.

## Kelite Corp.



R. J. Racine

... has appointed *Robert J. Racine* as Western regional sales manager. He was formerly associated with Wyandotte Chemicals Corp. as manager of industrial sales and has had field sales experience and technical service in the metals industries. Kelite manufactures industrial chemicals and steam cleaning equipment.

## Rinshed-Mason Co.

... has made *Roscoe F. Johnson* a member of the technical staff of its West Coast Division in Anaheim, Calif. Johnson has served for a number of years with manufacturers of metal decorating and can coatings, marine, and architectural finishes. *Arthur G. Grey* has joined the sales staff, while *Kieth Muller* has been transferred from the east to the California plant as industrial sales-service representative.

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IRVING G. KING & CO. ★ SINCE 821 MATEO ST. L. A. 21 1930

## B. F. Goodrich Co.

... has named *Edward Bosworth* plant engineer of its Los Angeles plant. He replaced *Thomas J. Cook*. Bosworth joined Goodrich in 1929 as an engineer and was recently transferred to Los Angeles as senior engineer at the West Coast tire plant.

## J. O. Ross Engineering Corp.

... has appointed *R. W. Grott* as district manager of the Seattle branch office. The office serves the Washington and Oregon territory. Grott has been in the Los Angeles office for five years as sales engineer.

## United States Rubber Co.

... has named *W. D. Ralston* as Portland district sales manager for the U. S. tires division, replacing *E. S. Morgan*. Ralston has served as the Seattle and San Francisco district truck tire salesman and as San Francisco assistant district sales manager prior to his present assignment.



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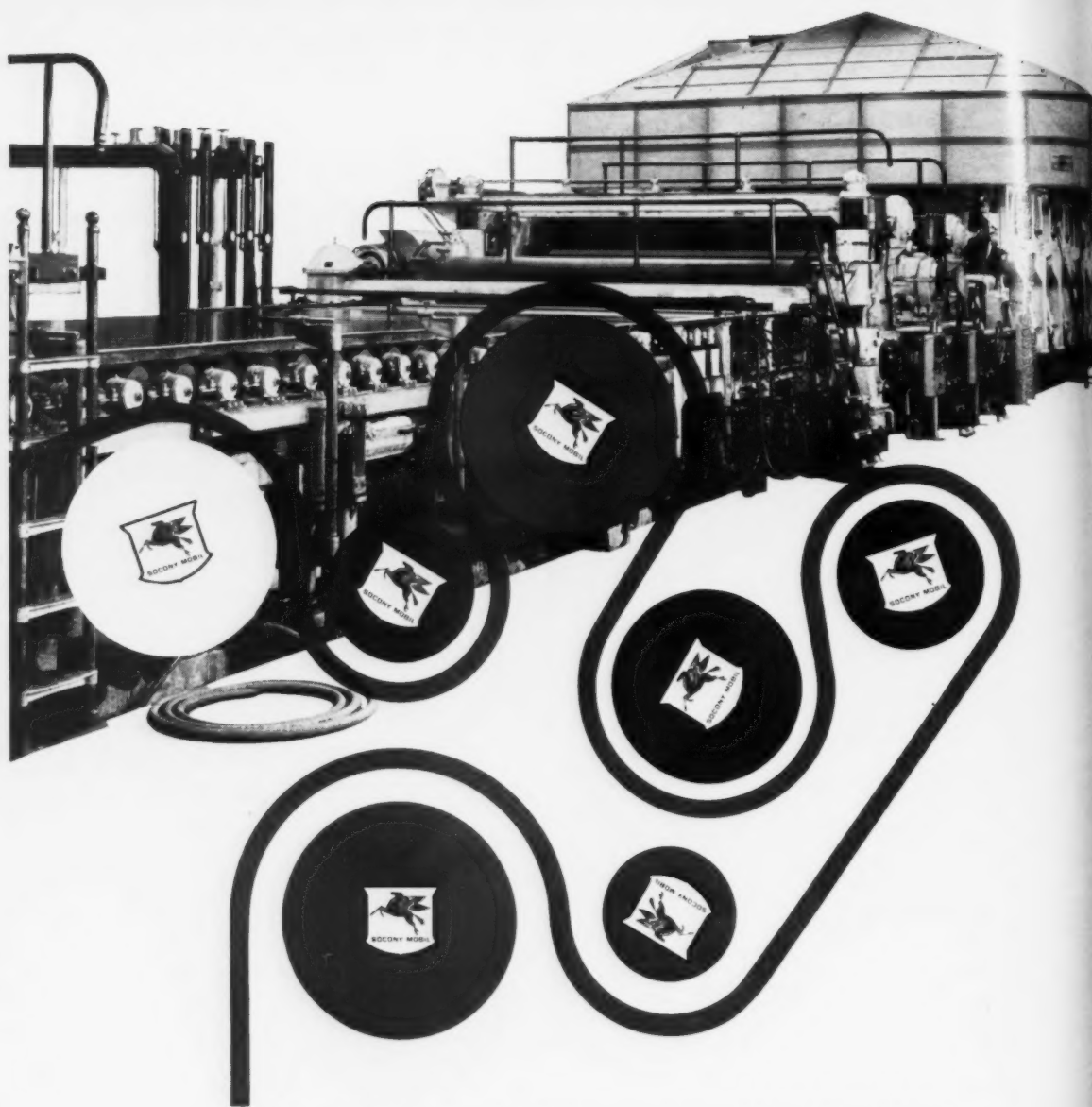
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